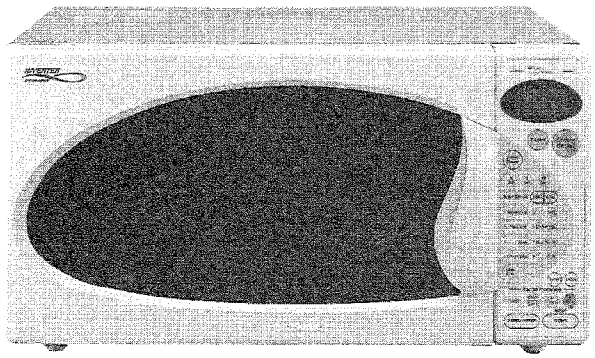
ORDER NO. MMOC9906072C3

Service Manual

Microwave Oven



MODELS	QPQ	JPG	VPE
NN-S759BA	○	–	–
NN-S759WA	○	○	○
NN-S769BA	○	○	–
NN-S769WA	○	–	○
NN-S789WA	○	○	–
NN-S989WA	○	○	–

Models sold in these markets:
QPQ - Australia
JPG - New Zealand
VPE - South Africa

Specifications:

Models:	NN-S759BA, NN-S759WA, NN-S769BA, NN-S769WA, NN-S789WA MODELS	NN-S989WA MODELS
Power Source:	240 V AC Single Phase, 50 Hz ••••• For QPQ Models 230 V AC Single Phase, 50 Hz ••••• For JPG Models 220 V AC Single Phase, 50 Hz ••••• For VPE Models	
Power Requirements:	1350W (6.0A)•••QPQ/JPG Models	1350W (6.0A)•••QPQ/JPG Models
Power Requirements:	1310W (6.2A)•••VPE Models	
Output: (IEC705-88)	1100W	1100W
Microwave Frequency:	2,450MHz	2,450MHz
Timer:	99 min. 90 sec. (Except 30 min. 00 sec. on High setting)	99 min. 99 sec.
Oven Cavity Size:	1.6 cu. ft.	2.1 cu. ft.
Outside Dimensions:	21 7/8" (W) X 18 7/8" (D) X 11 15/16" (H) 555mm (W) X 480mm (D) X 304mm (H)	23 7/8" (W) X 18 7/8" (D) X 14" (H) 606mm (W) X 480mm (D) X 356mm (H)
Oven Cavity Dimensions:	16 7/16" (W) X 8 1/2" (D) X 9" (H) 418mm (W) X 470mm (D) X 228mm (H)	18 7/16" (W) X 18 1/2" (D) X 10 11/16" (H) 469mm (W) X 470mm (D) X 271mm (H)
Weight:	32 lbs/14.4 kg	35 lbs/15.6 kg
Inverter Power Supply		
Output power: IEC705-88 Test procedure		
Specifications subject to change without notice		

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product dealt with in this service information by anyone else could result in serious injury or death.

DANGER OF HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LIVE) OF THE INVERTER POWER SUPPLY(U)

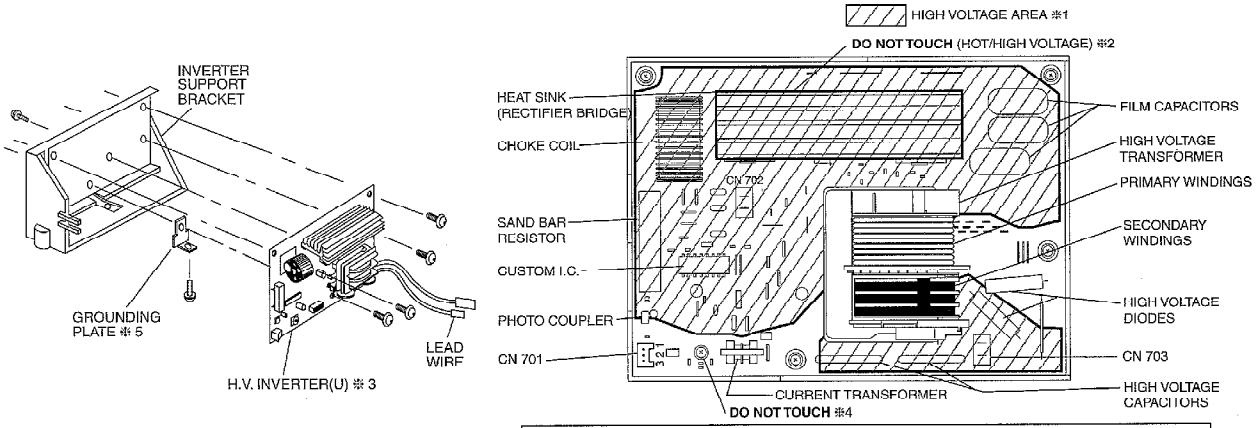
INVERTER WARNING NEW H.V.

This Inverter board looks like a regular PCB; However, this PCB drives the magnetron tube with extremely high voltage and high current.

IT HAS: 1. Very high voltage and high current circuits.
It functions the same as the high voltage transformer and high voltage capacitor in ordinary microwave ovens.
2. Aluminum heat sink is energized with very high voltages and high heat energy.
3. Very high voltage may remain in circuitry even when oven is off. High voltages may remain in the capacitors on the board.

DO NOT: ✻1. Do not touch circuitry because it has very hot (high voltage) circuitry. Even when replacing board, extreme care should be taken to avoid possible electric shock hazards. High voltage may remain in circuit.
✻2. Do not touch aluminum heat sink because it is very hot in high voltage and also very hot in high heat energy.
✻3. Do not try to repair Inverter PCB because it is very dangerous to repair it. Replace as whole High Voltage Inverter Circuit(U).
✻4. Do not try to adjust or tamper preset volume on the Inverter board because it is very dangerous to adjust without proper test equipment.
✻5. Do not test oven while Inverter grounding plate or screws are loose. It is very dangerous to operate the H.V. Inverter Circuit (U) with loose mounting screws or if improperly grounded.

INVERTER POWER SUPPLY DIAGRAM



DO NOT REPAIR. REPLACE WHOLE H.V. INVERTER(U)

WARNING

1. This product should be serviced only by trained qualified personnel.
2. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
3. If the unit cannot be repaired on site, advise the customer not to use until the unit can be repaired.
4. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

This service manual covers products for following markets.
When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.

QPQ ••••••••••••••••For Australia
VPE ••••••••••••••••For South Africa
JPG ••••••••••••••••For New Zealand

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.

(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
  (1) Interlock operation
  (2) Proper door closing
  (3) Seal and sealing surfaces (arcing, wear, and other damage)
  (4) Damage to or loosening of hinges and latches.
  (5) Evidence of dropping or abuse

(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.

(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

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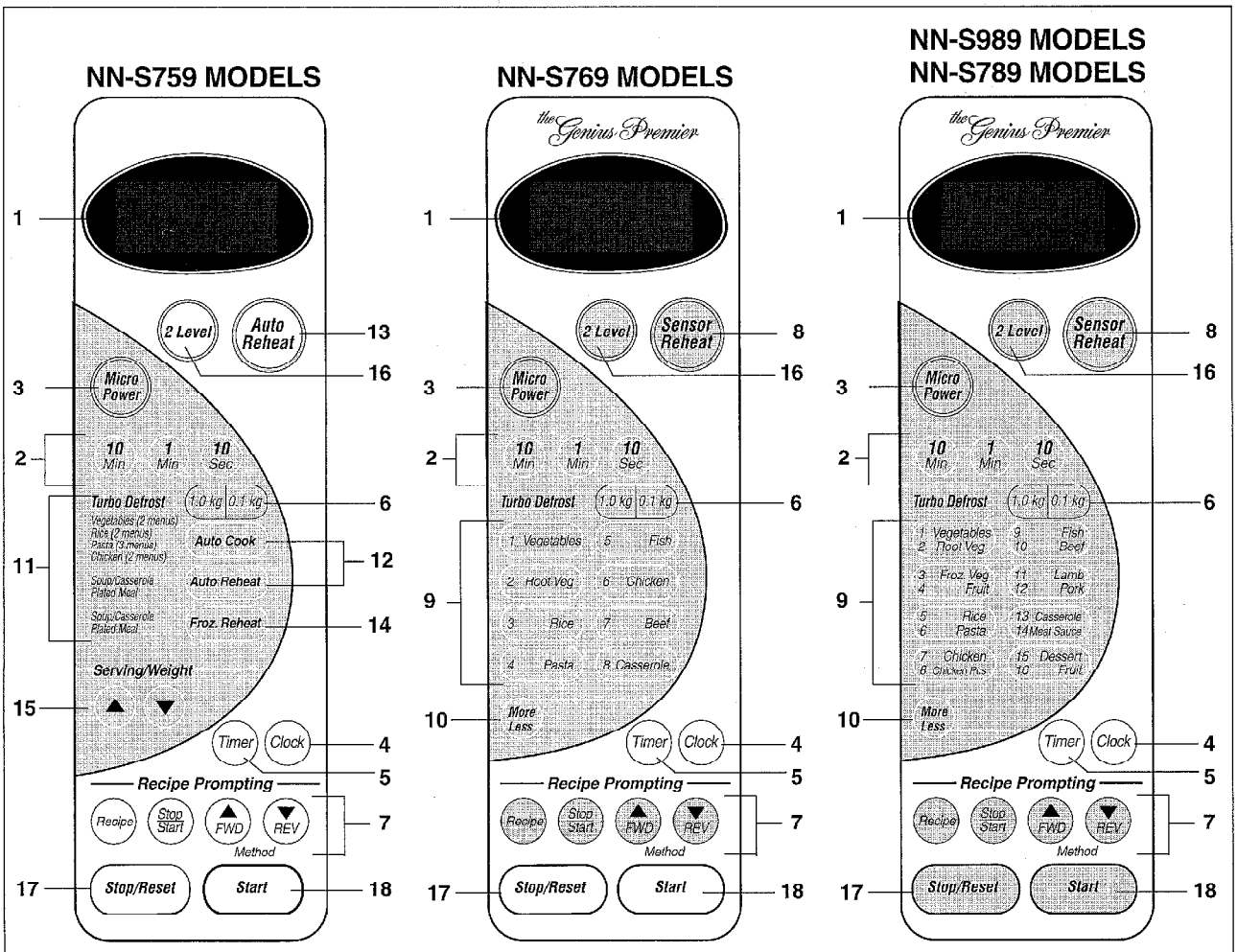
FEATURE CHART

FEATURE \ MODELS	NN-S759BA NN-S759WA	NN-S769BA NN-S769WA	NN-S789WA	NN-S989WA
2 Level Cooking	○	○	○	○
Five Stage Cooking	○	○	○	○
Turbo Defrost	○	○	○	○
Sensor Reheat	–	○	○	○
One Touch Cooking (Sensor)	–	○ 8 Menu	○ 16 Menu	○ 16 Menu
Micro Power	○	○	○	○
Auto Menu	○	–	–	–
Auto Reheat	○	–	–	–
Auto Cook	○	–	–	–
Frozen Reheat	○	–	–	–
Serving/Weight	○	–	–	–
More/Less	–	○	○	○
Recipe Prompting	○	○	○	○
Child Safety Lock	○	○	○	○
Operating Guide on the Display	○	○	○	○
Delay Start	○	○	○	○
Timer/Stand	○	○	○	○
Digital Clock	○	○	○	○

CONTROL PANELS



1 **Display Window**
2 **Time Pads**
3 **Micro Power Pad**
4 **Clock Pad**
5 **Timer Pad**
6 **Turbo Defrost Pads**
7 **Recipe Prompting Pads**
8 **Sensor Reheat Pad**
9 **One Touch Cooking Pads**
10 **More/Less Pad**
11 **Auto Menu Pads**
12 **Auto Cook Pad**
13 **Auto Reheat Pad**
14 **Frozen Reheat Pad**
15 **Serving Weight Pads**
16 **2 Level Cooking Pad**

17 Stop/Reset Pad

Before cooking: One tap clears your instructions.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day appears in the display window.

18 Start Pad

One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.

Word Prompters

When pads are pressed, a beep sound is heard and the corresponding letter or word(s) appear and roll across the window. If a pad is pressed and no beep is heard, the unit does not or cannot accept the instruction. As each pad is pressed the corresponding word(s) roll across the window. Words will automatically appear to prompt the user to perform the next step. It is not necessary to wait for the words to appear before pressing pads for the next step. A two beep sound is heard between stages. At the end of any complete program, the oven will beep five times and "ENJOY YOUR MEAL" will appear in the display window.

OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

Operation Guide on the display:
To assist you in programming, the next operation will appear on the display. When you get used to operating the oven, you can turn off the operating guide.

To turn off:

Timer → OPERATING GUIDE OFF

Press 3 times

To turn on:

Timer → OPERATING GUIDE ON

Press 3 times

1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	*WELCOME TO PANASONIC MICROWAVE OVEN COOKING*
2. Press Clock pad.	✳ ✳ ——SET TIME
3. Enter time of day (TOD) by pressing appropriate Time pads. NOTE: Use only Min. Time pads to set clock.	11✳25 ——PRESS CLOCK
4. Press Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	11:25

OPERATION	SCROLL DISPLAY
5. Set for 1 minute by pressing 1 Min. Time pad once.	1 00 MIN SEC ——PRESS START
6. Press Start pad.	10 SEC
7. When 1st stage cooking time has elapsed, oven beeps twice and automatically switches to 2nd stage cooking.	1 00 MIN SEC
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	ENJOY YOUR MEAL 11:25

2. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Place a water load in the oven.	
2. Press Micro Power pad once to set High power. (1st stage)	P 100 ——SET TIME
3. Set for 10 seconds by pressing 10 Sec. Time pad once.	10 SEC ——PRESS START
4. Press Micro Power pad 5 times to set Medium power. (2nd Stage)	P 60 ——SET TIME

3. Turbo Defrost

OPERATION	SCROLL DISPLAY
1. Set the weight for 1 kg by pressing 1.0 kg pad.	1.0 KG ——PRESS START
2. Press Start pad. Turbo Defrost cycle begins as time counts down.	14 40 MIN SEC
3. To stop befor Defrost cycle is complete Press Stop/Reset pad twice. Oven shuts off. Time of day or colon appears in the display.	11:25

4. Demonstration Mode

The demonstration mode is designed for retail store display. It is not designed for home use. Cooking will not operate during demonstration mode.
To set demonstration mode:

OPERATION	SCROLL DISPLAY
1. Press [Clock] pad 3 times continuously. Note: To cancel demonstration mode, press [Clock] pad 3 times continuously.	*WELCOME TO PANASONIC MICROWAVE OVEN COOKING* *– – PRESS ANY KEY*

5. To Set Child Safety Lock

OPERATION	SCROLL DISPLAY
1. Press [Start] pad 3 times continuously. "*LOCK" appears on the display.	**LOCK*

6. To Reset Child Lock

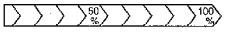
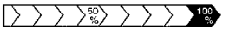
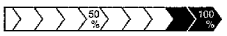
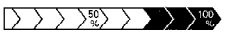
OPERATION	SCROLL DISPLAY
1. Press [Stop/Reset] pad 3 times continuously. Time of day or colon appears on the display	*11:25*

7. Sensor Cooking (NN-S769/S789/S989 Models)

NOTE: Make sure that the outer panel is installed before Sensor cooking test, since Sensor function does not operate properly without the outer panel.

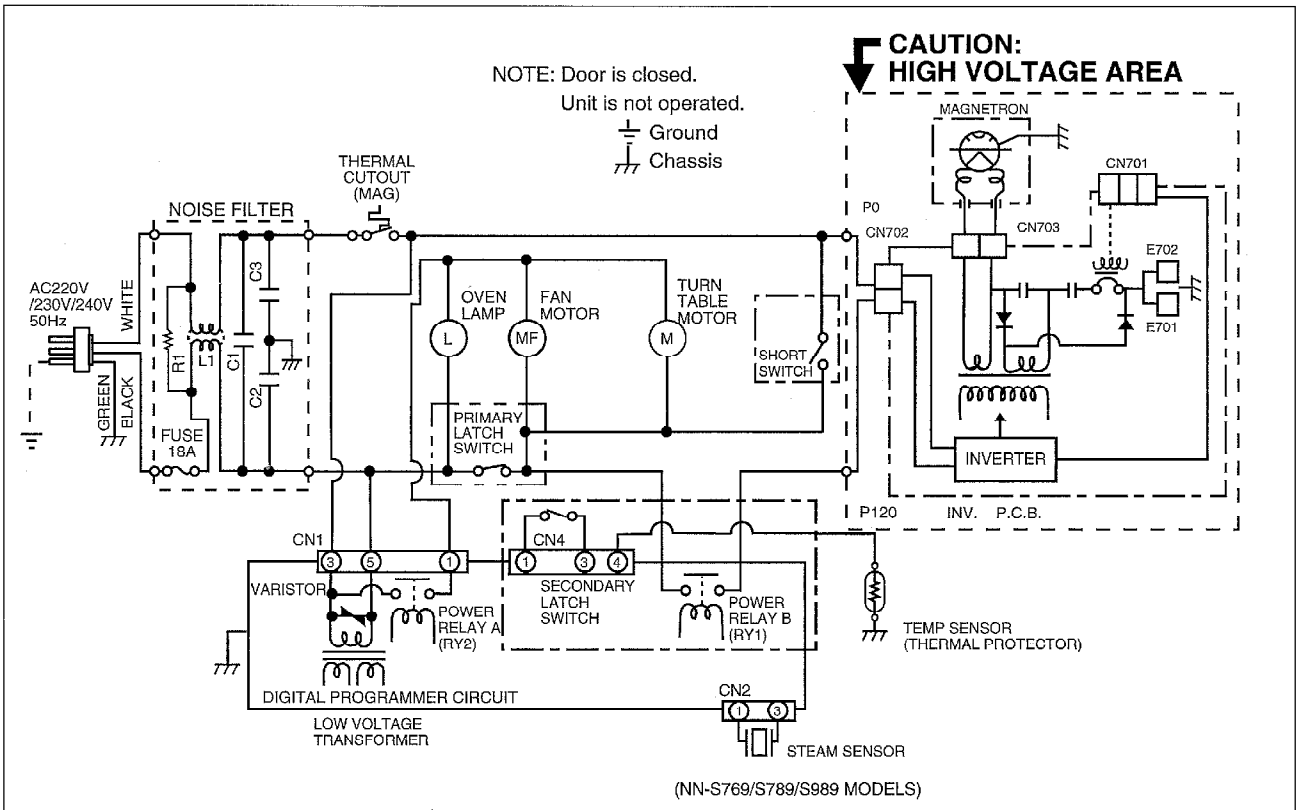
OPERATION	SCROLL DISPLAY
1. Pour 150 ±15cc (4.5±1/2ozs) of room temperature water in a beaker, place the beaker in the center of the oven.	
2. Press the desired Sensor Cooking Category pad. e.g. Set to Sensor Reheat	*SENSOR REHEAT* *——PRESS START*
3. Press [Start] pad.	*SENSOR*
4. The steam sensor detects steam about 1.5 to 4 minutes after the Start pad is pressed. Sensor cooking (T1) automatically switches to time cooking (T2). "Auto" disappears with beep sounds and the remainder of cooking time appears in the display window. NOTE: Cooking time will vary depending on the water temperature, the shape of the beaker or the power source voltage.	*8* *SEC* *23* *SEC*
5. When the balance of cooking time has elapsed, oven stops and beeps 5 times.	*ENJOY YOUR MEAL* *11:25*

10 Power Levels

Press Power Level	Power Level	Display Window
once	P100 (HIGH)	
twice	P 90	
3 times	P 80	
4 times	P 70 (MED. HIGH)	
5 times	P60 (MEDIUM)	
6 times	P 50	
7 times	P 40	
8 times	P 30 (MED. LOW)	
9 times	P 20	
10 times	P 10 (LOW)	

NOTE: You will see one of these 10 displays scroll at the bottom of the Display Window based on the Power level or cooking category selected.

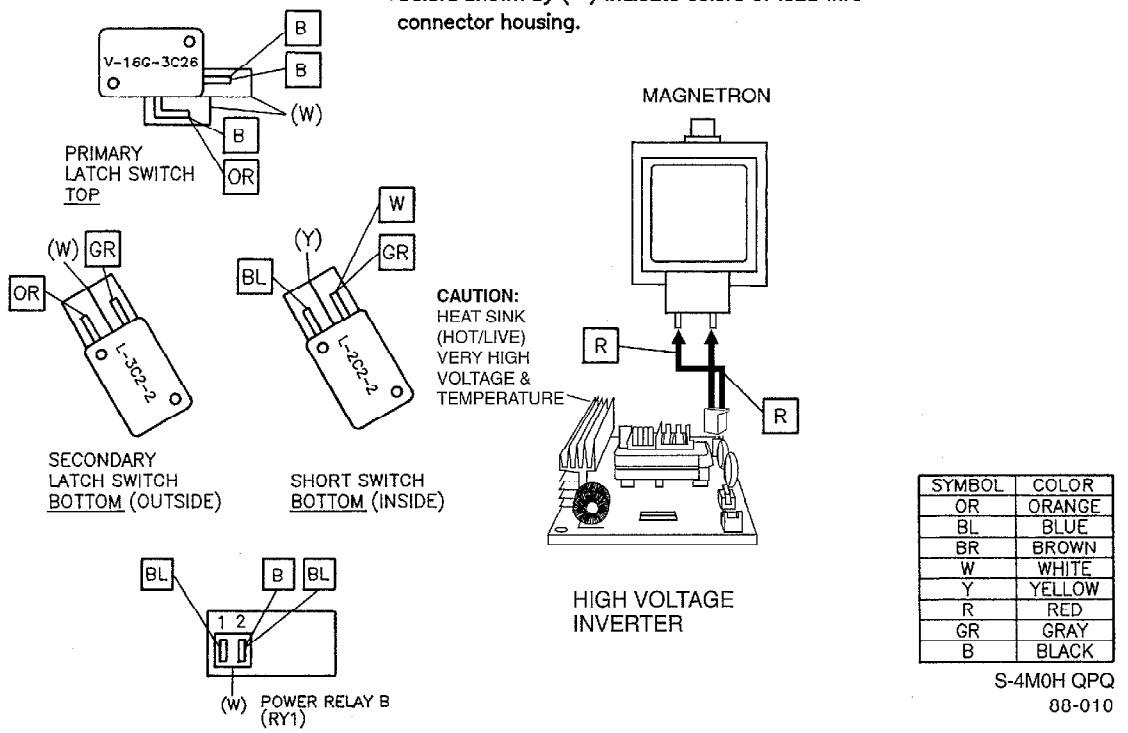
SCHEMATIC DIAGRAM (QPQ/JPG/VPE)



(NN-S769/S789/S989 MODELS)

WIRING DIAGRAM

NOTE: *When replacing, check the lead wire color as shown.
*Colors shown by ( ) indicate colors of lead wire connector housing.



SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-4M0H QPQ
88-010

DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay B (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Low" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

POWER SETTING		OUTPUT POWER (%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
			ON (SEC)	OFF (SEC)
HIGH	P100	100%	22	0
	P90	90%	22	0
	P80	80%	22	0
MEDIUM-HIGH	P70	70%	22	0
MEDIUM	P60	60%	22	0
	P50	50%	22	0
	P40	40%	22	0
MEDIUM-LOW	P30	30%	22	0
	P20	20%	15	7
LOW	P10	10%	8	14
DEFROST	P30	30%	22	0

2. Inverter Power Supply Circuit NEW H.V.

This Inverter Power Supply circuit supplies 4,000V DC to the magnetron tube from the line voltage, 220/230/240 50Hz AC input. It functions as the H. V. transformer, the H. V. capacitor and H. V. Diode.

1. The AC input voltage 220/230/240 50Hz is rectified to DC voltage immediately.
2. DC voltage will be supplied to the switching devices called IGBT. These devices will be switched ON-OFF by the 20 to 40 kHz PWM, (pulse width modulation) signal from the microcomputer in the DPC.
3. This drives the High voltage transformer to increase up to 2,000V AC and approximately 3V AC by means of transformer.
4. Then the half wave doubler voltage rectifier circuit, consisting of the HV diodes and Capacitors, generates the necessary 4,000V DC needed for the magnetron.
5. Output power of the magnetron tube is always monitored by the signal output from the current transformer built into the Inverter circuit.
6. Then this signal will be fedback to the microcomputer in the DPC to determine operating conditions and output necessary to control PWM signal to the Inverter Power Supply to control output power.

3. Inverter Turbo Defrost, Auto Reheat, Auto Cook

When these Auto Control features are selected and the Start Pad is tapped:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. Table shows the corresponding cooking times for respective serving by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

Turbo Defrost (All Models)

WEIGHT SELECTED	COOKING TIME
1.0 kg	14 min. 40 sec.
2.0 kg	30 min. 20 sec.
3.0 kg	46 min. 00 sec.

Auto Reheat (All NN-S759BA, NN-S759WA Models)

MENU	SELECTED SERVINGS/ WEIGHT		COOKING TIME
SOUP/CASSEROLE	1	250g	2 min. 20 sec.
	2	450g	3 min. 00 sec.
	4	850g	6 min. 00 sec.
PLATED MEAL	1	250g	2 min. 40 sec.
	2	450g	4 min. 20 sec.
	4	850g	6 min. 50 sec.

Auto Cook (All NN-S759BA, NN-S759WA Models)

MENU	SELECTED SERVINGS/ WEIGHT	COOKING TIME
Fresh Vegetables	250g	3 min. 00 sec.
	750g	7 min. 00 sec.
Frozen Vegetables	250g	4 min. 00 sec.
	750g	10 min. 00 sec.
Chicken Pieces	0.5kg	7 min. 30 sec.
	1.0kg	14 min. 00 sec.

Frozen Reheat (All NN-S759BA, NN-S759WA Models)

MENU	SELECTED SERVINGS/ WEIGHT		COOKING TIME
SOUP/CASSEROLE	1	250g	4 min. 00 sec.
	2	450g	7 min. 00 sec.
	4	850g	14 min. 00 sec.
PLATED MEAL	1	250g	5 min. 00 sec.
	2	450g	8 min. 00 sec.
	4	850g	15 min. 00 sec.

4. One Touch Cooking (Auto Sensor Cooking) (All NN-S769/S789/S989 Models)

Auto sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time.

All that is necessary is to select an Auto Sensor Program before starting to cook.

Understanding Auto Sensor Cooking

As the food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, a carefully designed instrument, called the steam sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.

Explanation of the Auto Sensor Cooking process

1) During the first 10 second period there is no microwave activity, and when calculating the T2 time by using the formula below make sure this 10 seconds is subtracted from the T1 time. In other words T1 time starts at the end of the 10 second period.
2) T1 time...The total amount of time it takes the microwave oven to switch to T2 time after the 10 second period.
3) T2 time...When the steam escapes from the cooking container placed in the oven, the steam sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

T2 time (in sec.)=T1 time X K factor

NOTE: Remember, the T1 time starts after the 10 second period. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE: When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds after the 10 second period, and the Auto program selected is Vegetables:

T2 = T1 X K
= 2 min. and 40 sec. X 0.3
= 160 sec. X 0.3
= 48 sec.

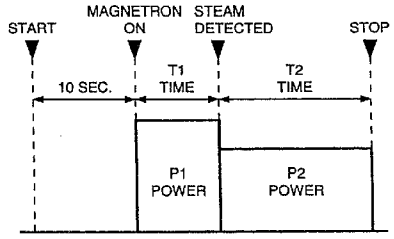
5. Sensor Reheat (All NN-769/S789/S989 Models)

Auto Sensor Reheat is a quick and easy way to reheat refrigerator and room temperature foods.

Simply press the reheat pad. There is no need to select power level and cooking time.

NOTE: The Auto Sensor Reheat process is same as Auto Sensor Cooking process.

AUTO SENSOR COOKING/REHEAT PROCESS



Auto Sensor Cooking (One Touch Cooking Models)

Category	P1 Power	P2 Power	K Factor Standard
Vegetables	HIGH	HIGH	0.3

Sensor Reheat (All Sensor Models)

Category	P1 Power	P2 Power	K Factor Standard
Sensor Reheat	HIGH	M. HIGH	0.1

6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.

(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

(C) Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage.)

CAUTION

MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE NEW H.V.

1. The following components have potentials above 250V while the appliance is operated.
   - ❊ Magnetron
   - ❊ High voltage transformer (Located on Inverter(U))
   - ❊ High voltage diodes (Located on Inverter(U))
   - ❊ High voltage capacitors (Located on Inverter(U))

   Pay special attention on these portions.
2. When the appliance is operated with the door hinges or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/cm^2. After repair or exchange, it is very important to check if magnetron and the door hinges are correctly fixed.

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Inverter Warnings NEW H.V.

DANGER OF HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LINE) OF THE INVERTER POWER SUPPLY(U)

This High Voltage Inverter Power Supply circuit supplies very high voltage and very high current for the magnetron tube. Though it is free from danger in ordinary use, extreme care should be taken during repair. As you can see, it looks like a TV flyback transformer, however the current is extremely large and so danger exists because of its high current and high voltages.

The aluminum heat sink is also energized with high voltage (HOT), so do not touch when AC input terminal is connected to the power line because one of the IGBT switching power devices (Collector) is directly connected to the Aluminum heat sink.

The Aluminum heat sink may be HOT from heat energy; therefore, extreme care should be taken during servicing and replacing.

WARNING OF INVERTER POWER SUPPLY(U) GROUNDING

Check the High Voltage Inverter Power Supply circuit grounding. This High Voltage Inverter Power Supply circuit board must have a proper chassis ground by the grounding bracket to the chassis ground; otherwise, this H.V. Inverter circuit board will expose very high voltage and cause extreme DANGER! Be sure to have proper grounding by the grounding plate and screws.

WARNING OF DISCHARGING HIGH VOLTAGE CAPACITORS

Warning about the electric charge in the high voltage capacitors. For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitors in the inverter power supply circuit board.

When replacing or checking parts, remove the power plug from the outlet and short the Inverter output terminal of the magnetron filament terminals to the chassis ground with an insulated handle screwdriver to discharge. Please make sure to touch chassis ground side first then short to the output terminals.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the primary, and secondary windings, choke coil and heat sink of the Inverter. It is extremely dangerous to work on or near these circuits with oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. When the 10 Amp fuse is blown due to the operation of short switch:

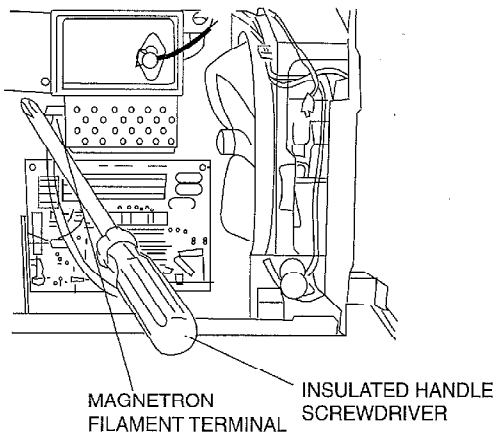
WARNING

When the 10 Amp. fuse if blown due to the operation of the short switch, you must replace power relay B, Primary latch switch and the short switch.

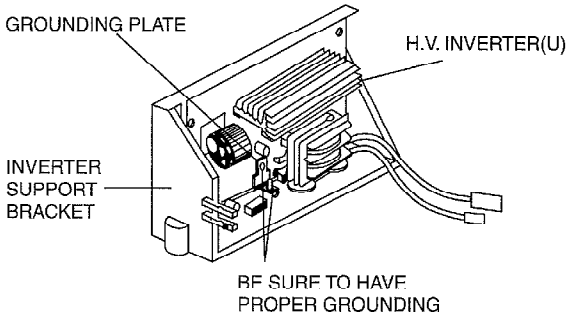
(A) This is mandatory. Refer to "Measurements and Adjustments" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



Touch chassis side first then short to the terminal of the magnetron filament terminal



DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

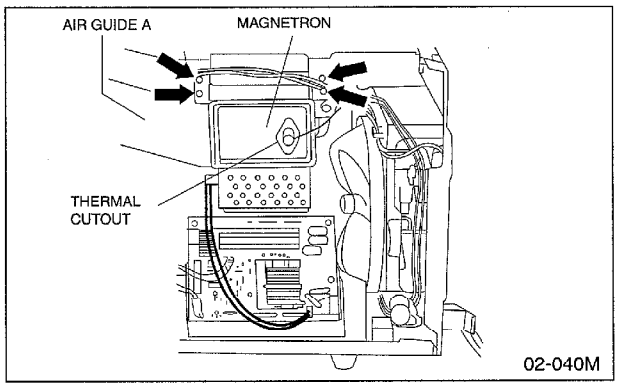
1. Magnetron

(A) Discharge the high voltage capacitors, as mentioned and shown on page 10.
(B) Remove 2 screws holding magnetron thermal cutout.
(C) Remove air guide A by freeing 2 catch hooks and detaching it from the magnetron and cavity.
(D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
(E) Remove 4 screws holding the magnetron.

NOTE: After replacement of the magnetron, tighten mounting screws in an X pattern, properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION

When replacing the magnetron, be sure the antenna gasket is in place.

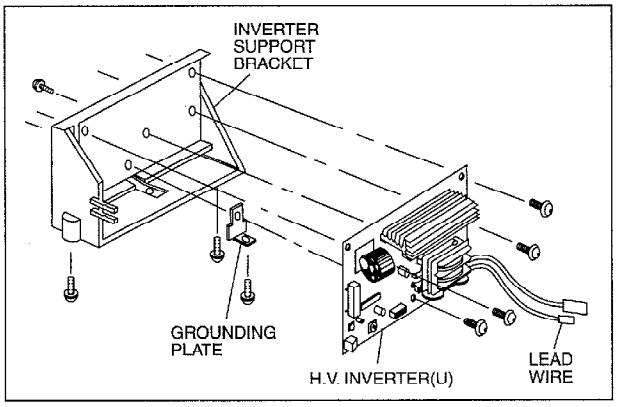


2. Inverter Power Supply(U) NEW H.V.

(A) Discharge the high voltage capacitors, as mentioned and shown on page 10.
(B) Unplug 3 lead wire connectors from the Inverter Power Supply board.
(C) Remove 3 screws to remove Inverter Power Supply board from chassis (base).
(D) Make sure not to loose grounding plate from the Inverter bracket.
(E) Remove 5 screws holding Inverter Power Supply board to the Inverter bracket.
(F) Replace with replacement PCB and follow the steps in reverse.

CAUTIONS WHILE REPLACING INVERTER POWER SUPPLY(U)

1. Make sure to leave grounding plate in its place.
2. Make sure to securely tighten grounding screw from the bottom of chassis (base).
3. Securely connect 3 lead wire connectors.
4. Make sure the heat sink has enough space (gap) from the oven. Take special care not to touch any lead wire to the aluminum heat sink because it is hot.



3. Digital Programmer Circuit (DPC) and membrane key board.

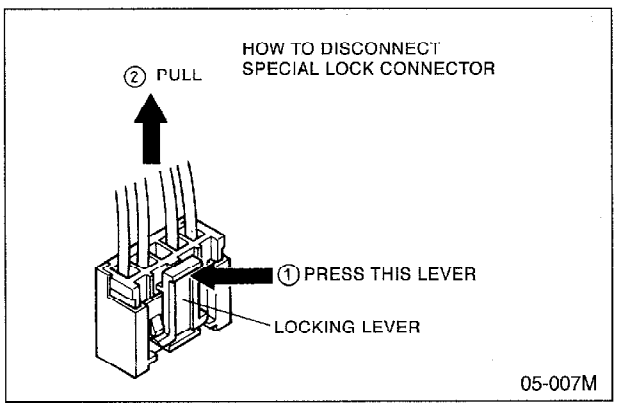
NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

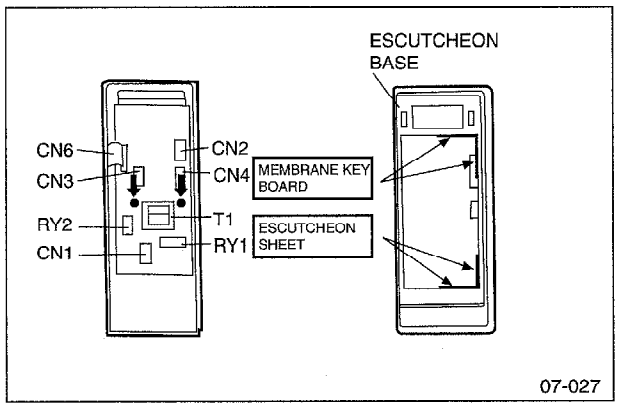
(A) Disconnect all connectors from D.P.C.
(B) Remove 1 screw holding escutcheon base to cavity ground and slide the escutcheon base upward slightly.
(C) Release flat cable connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
(D) Remove 2 screws holding DPC.

To replace membrane key board

(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.

NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Alignment position of membrane key board is as follows (see figure 07-027);
Membrane key board: Right and upper edges
Escutcheon sheet: Right and lower edges





4. Low voltage transformer and/or power relays (RY1, RY2)

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

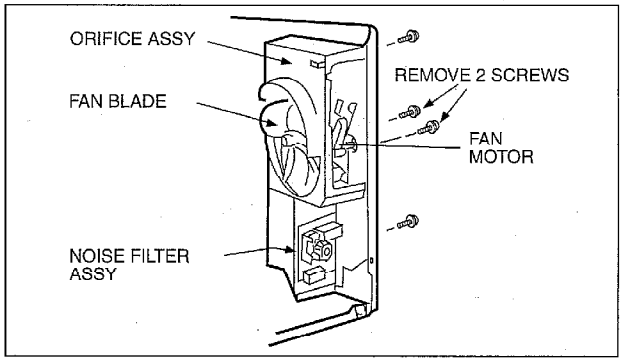
5. Fan motor

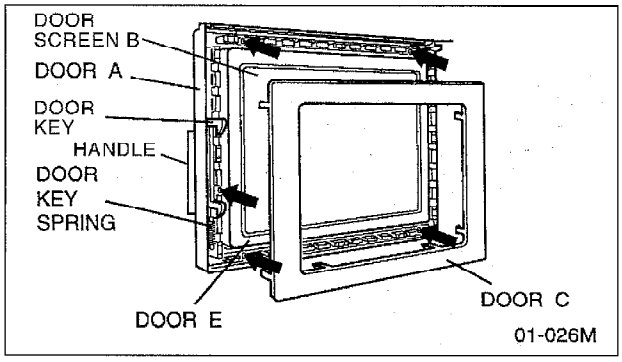
(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 4 lead wires from noise filter assy terminals.
(C) Remove 2 screws holding fan motor to the cavity.
(D) Remove orifice assy by removing 2 screws and freeing 4 catch hooks and detach the orifice assy with fan motor from oven assy.
(E) Remove fan blade from the fan motor shaft by pulling it straight out.
(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.
(G) Remove noise filter assy by freeing the snap hook and sliding it out.

6. Door disassembly

(A) Remove door C from door E by carefully pulling outward starting from upper right hand corner using a flat blade screwdriver.
(B) Remove 4 screws holding door E to door A.
(C) Remove 1 screw holding door E and handle to door A and separate door E from tabs on door A.
(D) Remove handle by sliding it out from door screen B.
(E) Remove door screen B from door A.
(F) Remove door E from hinges by lifting it up and out.
(G) Remove door key and door key spring.

After replacment of the defective component parts of the door, reassemble and install it and perform microwave leakage test.





7. Turntable motor

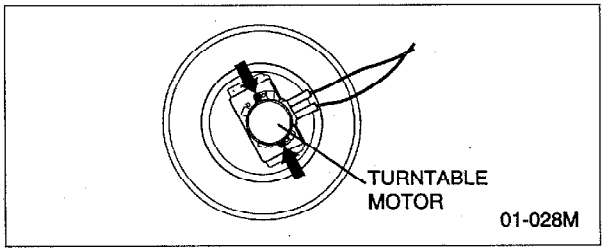
(A) Remove the motor cover by breaking off at the 8 spots indicated by arrows with a cutter or the like. (See Figure 01-046)

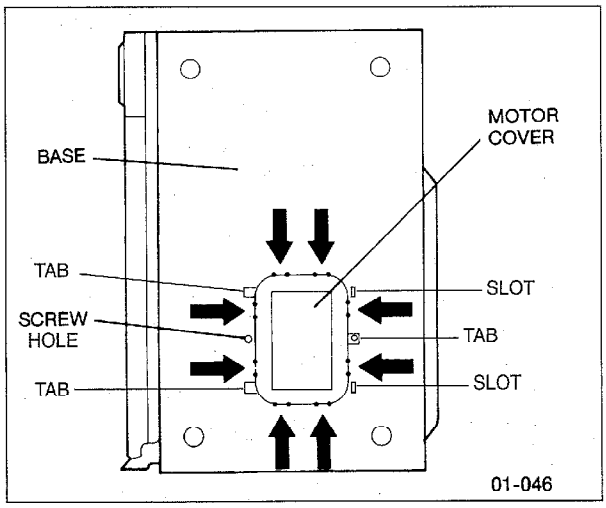
NOTE: After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bent to inside so that no sharp edges will be exposed to the outside.

(B) Disconnect 2 lead wires connected to the turntable motor.

(C) Remove the turntable motor by removing 2 screws.

NOTE: After reinstalling the new turntable motor and reconnecting the 2 lead wires, reinstall the motor cover by rotating it around 180°, tucking the 2 tabs under the base into the 2 provided slots, then screw the single tab to the base using a 4 x 6 screw (not provided).





8. Steam Sensor (NN-S769/S789/S989 Models Only)

(A) Remove 1 screw holding steam sensor unit.

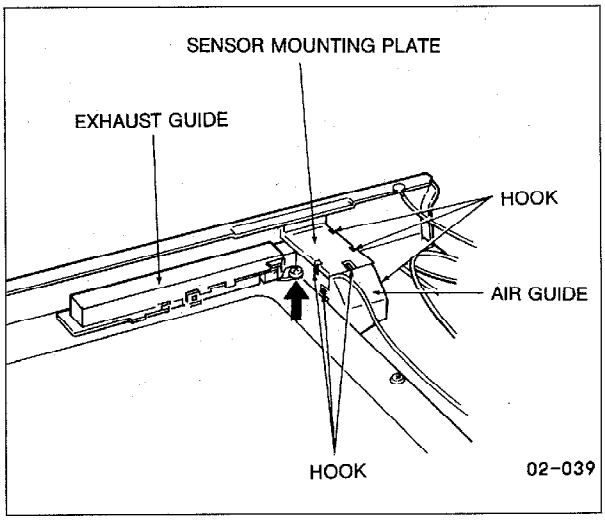
(B) Disconnect CN2 connector from digital programmer circuit board.

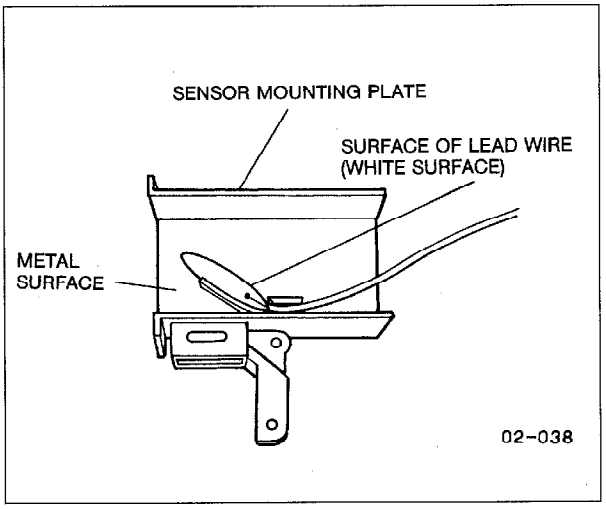
(C) Remove exhaust guide from steam sensor unit.

(D) Remove catch hooks on sensor mounting plate and air guide.

(E) Remove steam sensor from sensor mounting plate.

NOTE: When installing the steam sensor, make sure that the direction of steam sensor is as shown in figure.





COMPONENT TEST PROCEDURE

CAUTION NEW H.V.

1. High voltage is present at the high voltage terminal of the High Voltage Inverter(U) including aluminum heat sink during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitors.

1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power Relay B) Interlocks.

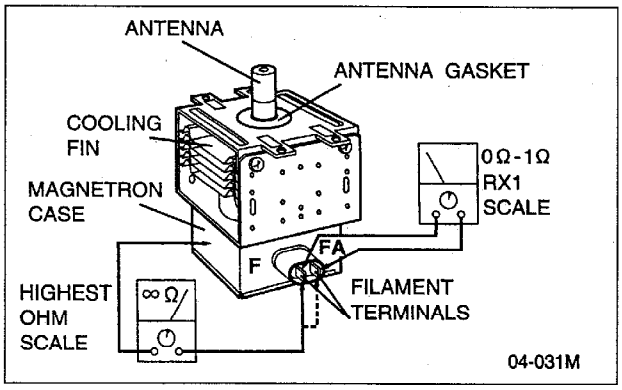
(A) Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.
(B) Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
(C) Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Secondary Latch Switch	∞ Ω (open)	0 Ω (close)
Power Relay B	∞ Ω (open)	∞ Ω (open)

2. Short Switch & Monitor Circuit NEW H.V.

(A) Unplug lead wires from H.V. Inverter primary terminals.
(B) Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Inverter.
(C) Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	∞ Ω



3. Magnetron

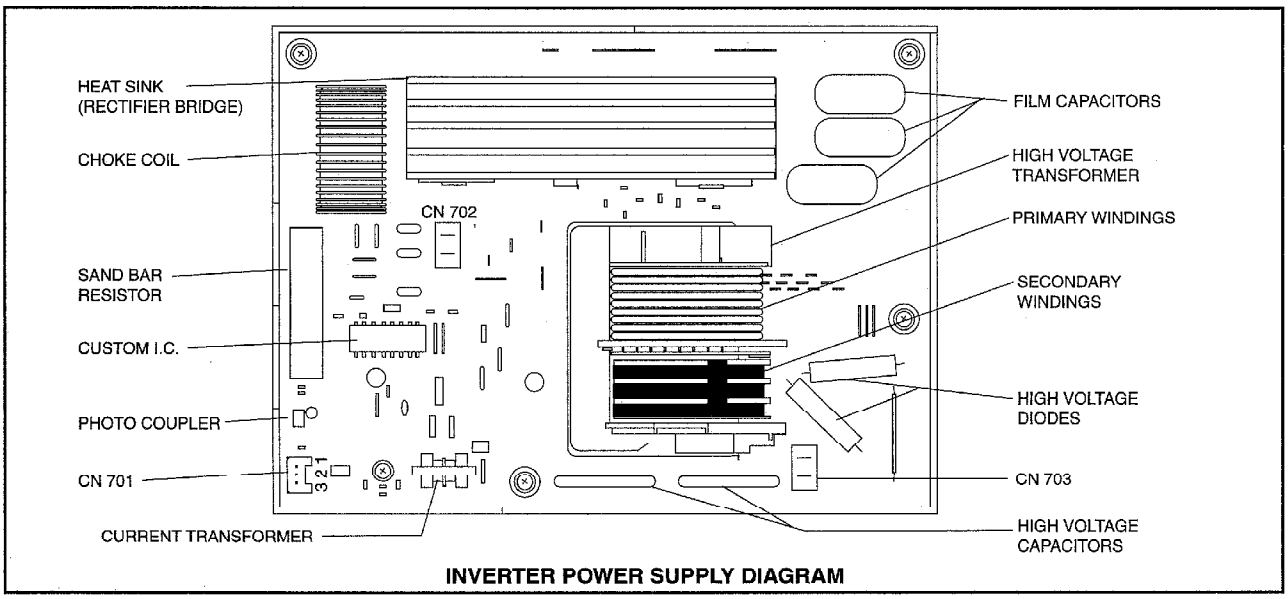
Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.
(A) Isolate magnetron from the circuit by disconnecting the leads.
(B) A continuity check across magnetron filament terminals should indicate one ohm or less.
(C) A continuity check between each filament terminal and magnetron case should read open.

4. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

5. Inverter Power Supply (U)

DO NOT try to REPAIR this H.V. Inverter power supply(U). Replace as whole H. V. Inverter(U) Unit.



INVERTER POWER SUPPLY DIAGRAM

6. Inverter Power supply(U) NEW H.V.

DANGER HIGH VOLTAGE

Test if failure codes of H97 or H98 appears by doing the following procedure. It is recommended to use an AC line input current Ampere meter for testing.

Test 1

A. Place 1 liter of water load into oven cavity.
B. Unplug 2 pin H. V. lead wire connector CN703 from magnetron tube.
C. Program oven at High power for 1 minute and press start.
   1. After approx. 15 seconds, oven displays H98 and stops oven.
   2. During oven operation, input current is approx. at 1.0 to 1.7A
      If both 1 and 2 are OK, please proceed to test 2.

	INPUT AMPERE	FAILURE CODE
Unplug CN703	1.0 to 1.7A	H98

Test 2

Continued from Test 1
A. Unplug 3 pin connector, CN701
B. Set oven at High power for 1 minute and start.
   1. After approx. 27 seconds, oven displays H97 and stops oven.
   2. During oven operation, input current is approx. at 0.4 to 0.8A.

	INPUT AMPERE	FAILURE CODE
Unplug CN701	0.4 to 0.8A	H97

If both 1 and 2 are OK, the Inverter Power Supply (U) can be determined OK.

7. Temp sensor (Thermal protector)

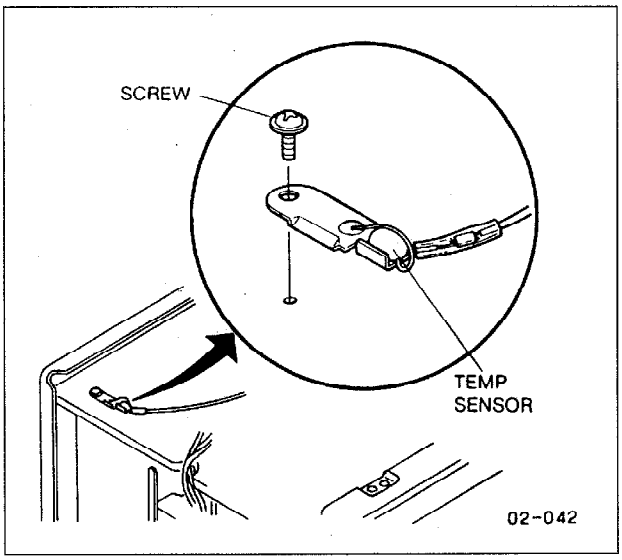
A temp sensor is mounted on top of the oven cavity at the left side. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason.
The thermal protector will shut the oven down when the temperature of the cavity reaches 257°F (125°C).
The device is connected to the DPC on touch control models.
When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display will go to reset mode.
The cooking program can be reset after cool-down.
THERMISTOR RESISTANCE VALUE
30K-120K at 10°C-30°C (50°F-86°F)

8. Steam Sensor and Digital Programmer Circuit

In order to determine if the steam sensor function of the digital programmer circuit is in working order or not, do the following test.

1) Place a water load (150 cc) in the oven.
2) Tap Sensor Reheat pad.
3) Tap Start Pad.
4) Steam Sensor detects steam about 1.5 to 4 minutes after the Start Pad is tapped.
5) T1 time cooking automatically switches to remaining time cooking (T2).
6) The remaining cooking time (T2) appears in display window. If the following cooking time appears, Steam Sensor function is normal.

T1 TIME	T2 TIME (Remaining cooking time)
1 Min. 30 Sec.~4 Min.	8 Sec.~23 Sec.



MEASUREMENTS AND ADJUSTMENTS

WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts (For touch models Part No. ANE6142-1450, Type No. V-16G-3C26-M for Primary latch switch; Part No. A61425180AP, Type No. L-3C2-2 for Secondary latch switch; Part No. A61785180AP, Type No. L-2C2-2 for short switch and Part. No. AEG5J1EG12B/AEG5J1EG18B, Type No. G5J-1-TP for power relay B (RY1))
* When the 10 Amp. fuse is blown due to the operation of the short switch, you must replace power relay B, Primary latch switch and the short switch. Then follow the installation procedures below.
* Interlock switch replacement — In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

1. Installation of Primary latch switch, Secondary latch switch and Short switch.

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in the illustration.

NOTE: **No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.**

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch, Primary & Secondary latch switches and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

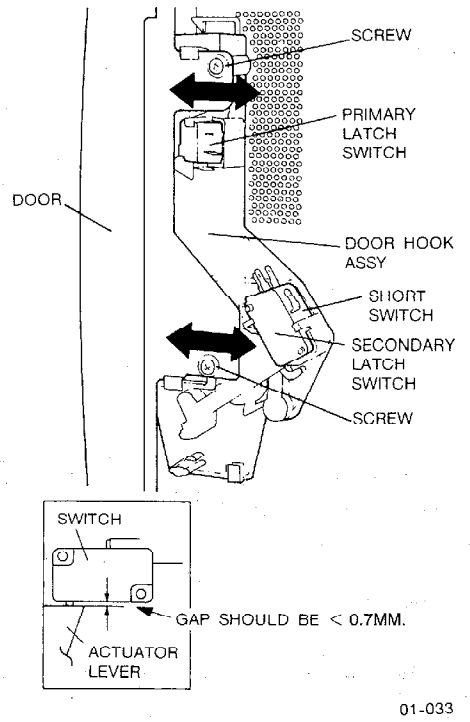
NOTE: **Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.**

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate.
Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

(D) The normal temperature rise at High power position for each model is as shown in table.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 0.7 mm when the door is closed.

TABLE (1ℓ -1min. test)

RATED OUTPUT	TEMPERATURE RISE
1100W (IEC705-88)	Min. 16.2°F (9.0°C)

TROUBLESHOOTING GUIDE NEW H.V.

CAUTION

1. **DO NOT try to REPAIR this H.V. Inverter power supply(U). Replace as whole H. V. Inverter(U) Unit.** When returning H. V. Inverter(U) make sure to pack as originally packed.
2. **DO NOT RE-ADJUST PRESET VOLUME on the H. V. Inverter(U).** It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very large current with very high voltage. Off alignment of inverter board operation will be dangerous.
3. Ensure proper grounding before checking for trouble.
4. Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.
5. Discharge high voltage remaining in the Inverter(U).
6. When checking the continuity of the switches or the H. V. Inverter, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
7. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
8. 220/230/240V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

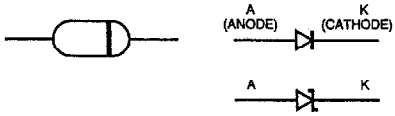
Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness. 2. Open thermal cutout (Magnetron) 3. Open low voltage transformer 4. Defective DPC	Check fan motor when thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Defective Inverter power supply (U) NEW H.V. Refer to component test procedure (pg. 14)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay B's contacts (between 1 and 2) and if it has continuity, replace power relay B also.	
3.	Oven does not accept key input (Program).	1. Key input is not in sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Oven lamp and fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to have lower output and/or have intermittent oscillation 3. Defective high voltage component H.V. Inverter NEW H.V. Magnetron 4. Open or loose wiring of power relay B 5. Defective primary latch switch 6. Defective power relay B or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure (pg. 14) and replace if it is defective. Refer to DPC troubleshooting

	SYMPTOM	CAUSE	CORRECTIONS
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician Refer to output test procedures by water temperature raising test.
8.	Fan motor and oven lamp turn on when door is opened.	1. Shorted primary latch switch	
9.	Oven does not operate and return to plugged in mode as soon as start pad is pressed.	1. Defective DPC	Check tighten screws on escutcheon base bracket and D.P.C. board.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout (Magnetron)	Adjust door and latch switches.
13.	Oven returns to plugged in mode after 10 seconds elapses on the Auto sensor cooking mode.	1. Open or loose wiring of sensor terminal from DPC 2. Open steam sensor 3. Defective DPC	

HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode



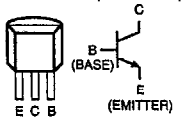
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC·····

2SD·····

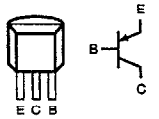


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

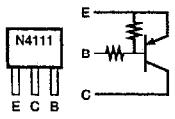
2SB·····



	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

Digital Transistor

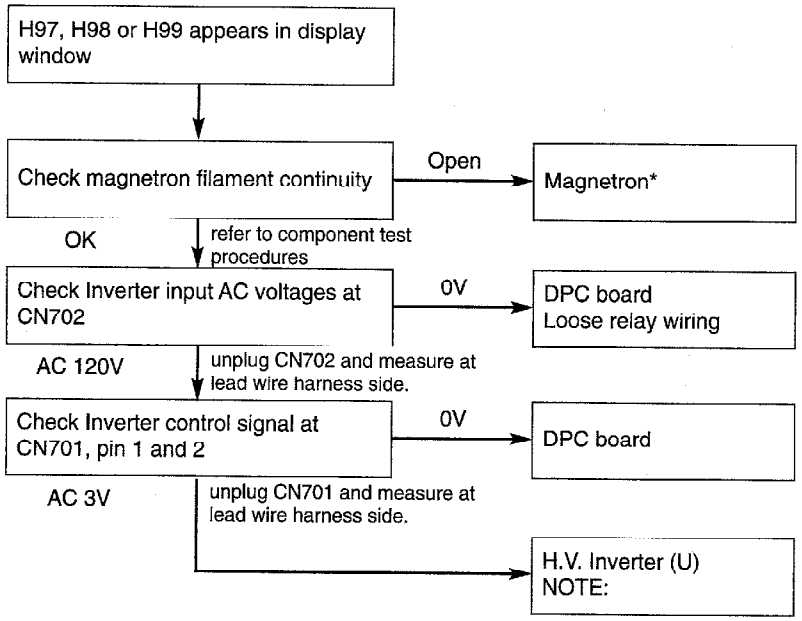
PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ~30kΩ	10kΩ~30kΩ
C-B	50kΩ~90kΩ	∞
C-E	40kΩ~80kΩ	∞

Troubleshooting of Inverter Circuit (U) and Magnetron NEW H.V.

This oven is programmed with a self diagnostics failure code system which will help for troubleshooting. H97, H98 and H99 are the provided failure codes to indicate magnetron and inverter circuit problem areas. This section explains failure codes of H97, H98 and H97, H98, H99 appears in display window a short time after start key is pressed and there is no microwave oscillation.

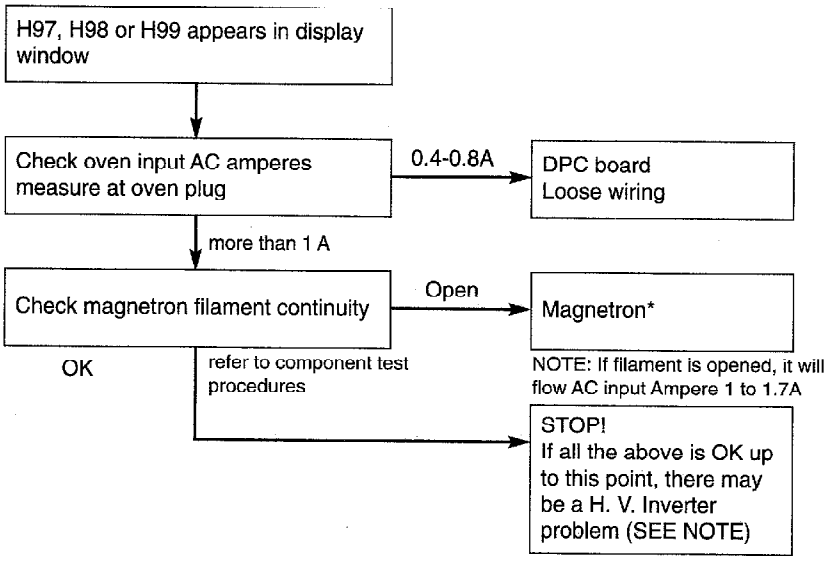


NOTE: DO NOT try to REPAIR this Inverter Power Supply (U) and also DO NOT RE-ADJUST PRESET VOLUME on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of inverter board operation is dangerous.
Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

* Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

Alternative way to troubleshoot oven with AC Ampere meter used. NEW H.V.

H97, H98, H99 appears in display window a short time after start key is pressed and no microwave oscillation with AC Ampere meter used for troubleshooting.


H97, H98 or H99 appears in display window
Check oven input AC amperes measure at oven plug
0.4-0.8A
DPC board
Loose wiring
more than 1 A
Check magnetron filament continuity
Open
Magnetron*
OK
refer to component test procedures
NOTE: If filament is opened, it will flow AC input Ampere 1 to 1.7A
STOP!
If all the above is OK up to this point, there may be a H. V. Inverter problem (SEE NOTE)

NOTE: DO NOT try to REPAIR this Inverter Power Supply (U) and also DO NOT RE-ADJUST PRESET VOLUME on the board. It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very high voltage and very large current. Off alignment of Inverter board operation is dangerous.
Operating a misaligned inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

* Check magnetron filament for open or short to casing before proceeding to determine a good magnetron.

Trouble Related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in. Oven is dead.	1	Fuse pattern of DPC	Normal	STEP 2
			Open (NOTE)	Shorted Circuit of ZNR, L.V.T., Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 15 voltage (Emitter of Q10)	Abnormal	ZD1, Q10
			Normal = 5V	→ Step 4
	4	IC-1 pin 10 voltage (15 pin of IC-220)	Abnormal	IC-220
			Normal	→ IC-1, CX1

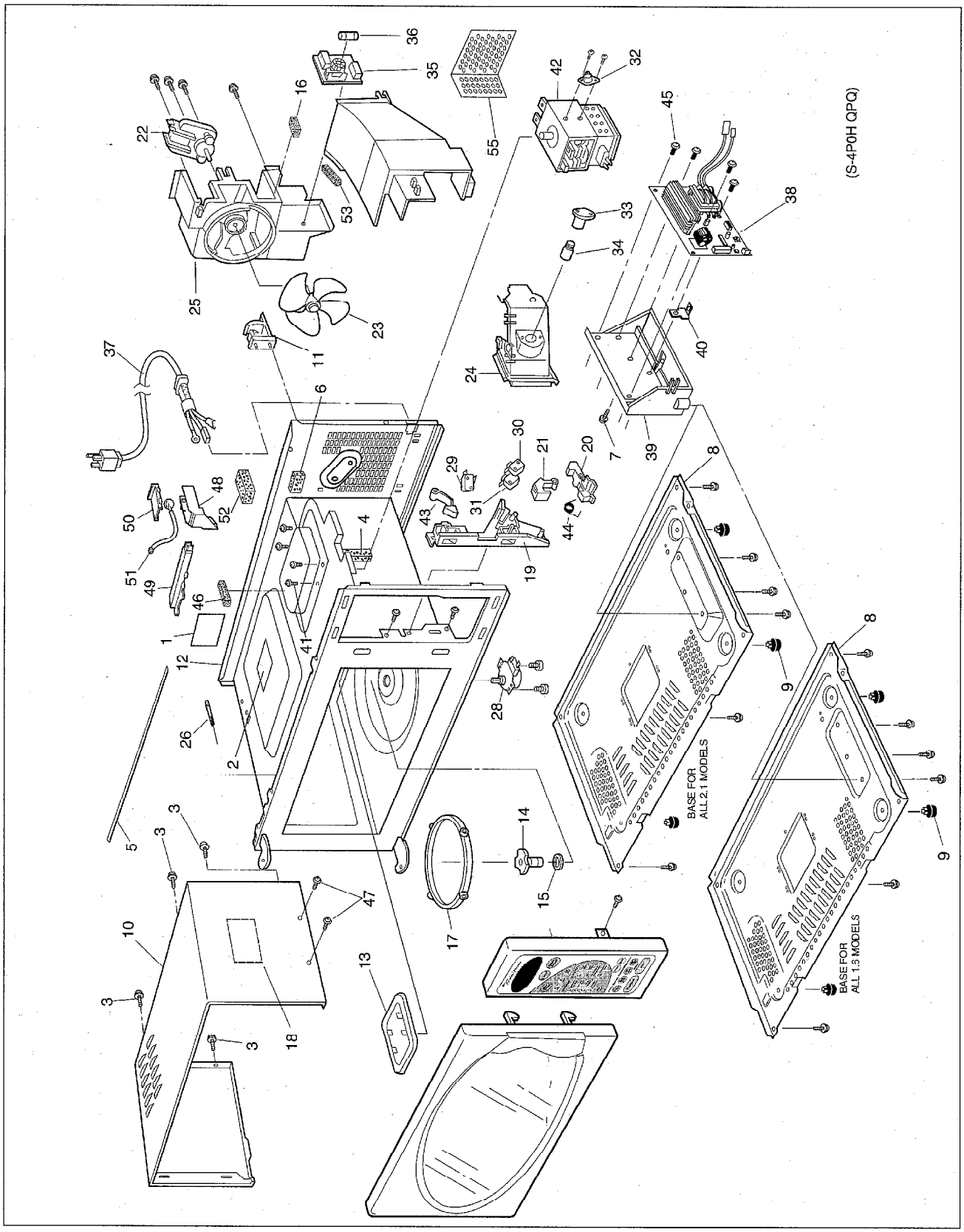
NOTE
Procedure of fuse pattern repairing is as follows:
1. When the fuse pattern (PF2) opens.
(1) Remove the jumper wire (PF1).
(2) Insert the removed jumper wire (PF1) to "(PF2)" position and solder it. If both "PF1" and "PF2" fuse patterns are open, please replace DPC.

2. When the fuse pattern (PF4) opens.
(1) Remove the jumper wire (PF3).
(2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4" fuse patterns are open, please replace DPC.

NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 76 voltage	Abnormal	IC-1
			Normal	BZ
Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 3 voltage while operation	Abnormal	IC-1,
			Normal = 5V	→ Step 2
	2	Short circuit between pin 6 and pin 16 of IC-220	Still not turn on	RY-2
			RY-2 turns on	IC-220
No microwave oscillation at any power setting	1	IC-1 pin 8 and pin 80 voltages while operation at high power	Abnormal	IC-1
			Normal 5---5V, 15---5V	→ Step 2
	2	Q220 transistor	Abnormal	Q220
			Normal	IC-2, RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY
H97/H98 appears in window and oven stops operation. Program High power for 1 minute and conduct following test quickly, unless H97/H98 appears and oven stops. NEW H.V.	1	Unplug CN702(2 pin) connector and measure voltage between terminals	0V	1. Latch switch 2. DPC/Power relay
			AC line voltage of 120V	→ Step 2
	2	Unplug CN701(3 pin) connector and measure pin 1 voltage	0V	1. DPC
			Approx. AV 3V	1. Magnetron
TO BE CONTINUED FOR AUTO SENSOR MODELS				
Auto sensor cooking does not operate normally. (Steam Sensor cooking does not detect steam from foods.)	1	Steam sensor terminal voltage by using high impedance tester (20k Ω/V), when breathe on metal surface of sensor	Abnormal = 0V	Steam sensor
			Normal ≥ 10-30mV	IC-1

EXPLODED VIEW AND PARTS LIST



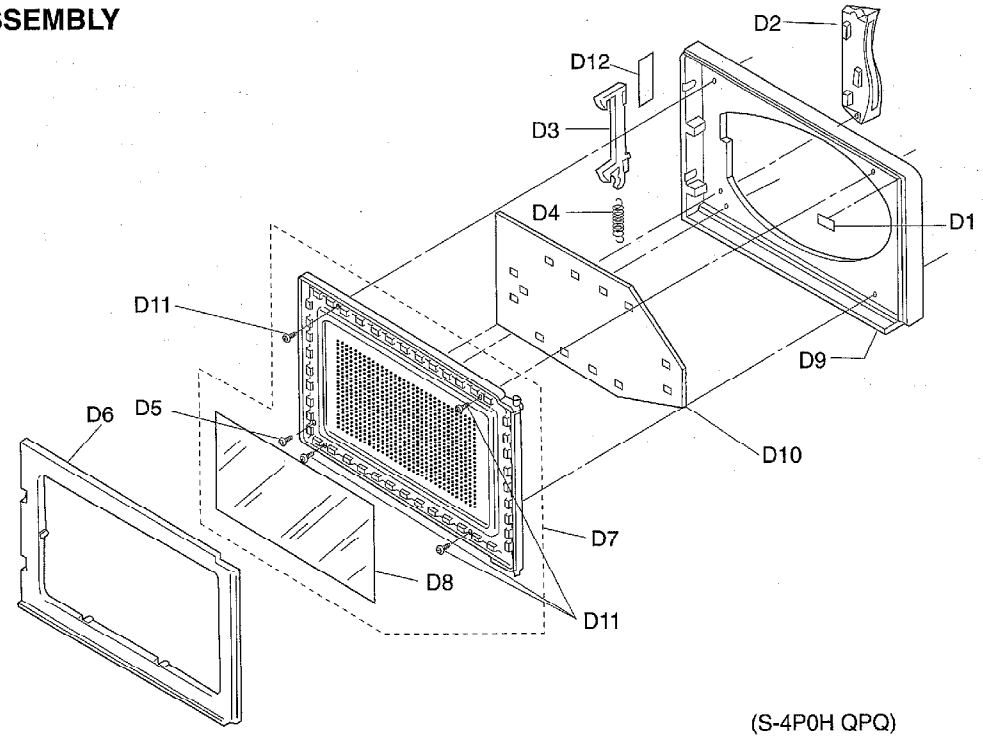
PARTS LIST

NOTES: • When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.
• Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
• Items marked * supplied by MMOC (MAC). (U.S.A.)
• Items marked # are new Part No's. for Pre I.G. (Initial Guidance) list.

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*1		B00065460JP	CAUTION LABEL	1	
*2		B03478250AP	COVER SHEET	1	
*3		XTW4-12D	SCREW	4	
*4		AMQ0924000AH	CUSHION RUBBER A	1	
*5		B19314P00AP	SPACER	1	
*6		AMQ0902000FD	CUSHION RUBBER A	1	
*7		XTW3+18B	INVERTER GROUNDING SCREW	1	
*8		B10014P00AP	BASE / 1.6	1	
*8		B10014M00AP	BASE / 2.1	1	
*9		B10088250AP	RUBBER FOOT	4	
*10		B10094P00QP	CABINET BODY / BLACK / 1.6	1	NN-S759BAQPQ, NN-S769BAQPQ/JPG
*10		B10094P00HQP	CABINET BODY / WHITE / 1.6	1	ALL NN-S759WA/S769WA/S789WA MODELS
*10		B10094M00HQP	CABINET BODY / WHITE / 2.1	1	NN-S989WAQPQ/JPG
*11		B11408760AP	STOPPER A	1	
*12	⚠	B200A4P00AP	OVEN / 1.6	1	ALL 1.6 MODELS
*12	⚠	B200A4M00AP	OVEN / 2.1	1	ALL 2.1 MODELS
*13		B20554M00AP	CEILING COVER	1	
*14		B21315540AP	PULLEY SHAFT	1	
*15		B21777050AP	WASHER	1	
*16		B80255950AP	ESCUTCHEON CUSHION	1	
*17		B290D4M00AP	ROLLER RING (U)	1	
*18		B60704760JP	INSULATION SHEET	1	
*19	⚠	B3020-1480	DOOR HOOK A	1	
*20		B3137-1480	HOOK SPACER B	1	
*21		B3138-1480	HOOK SPACER C	1	
*22		2Z-9AUA.S.	FAN MOTOR	1	(120V, 24W, AC, SINGLE PHASE)
*23		B40084M00AP	FAN BLADE	1	
*24		B40254M00AP	AIR GUIDE A	1	
*25		B41444M00AP	ORIFICE	1	
*26	⚠	B03534M00AP	TEMP SENSOR W/LEAD WIRE	1	
*27		B40264M00AP	AIR GUIDE B	1	
*28		A63268960JP	TURNTABLE MOTOR	1	(3W)
*29	⚠	ANE6142-1450	MICRO SWITCH	1	(V-16G-3C26-M) PRIMARY LATCH SWITCH
*30	⚠	A61425180AP	MICRO SWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
*31	⚠	A61785180AP	MICRO SWITCH	1	(L-2C2-2) SHORT SWITCH
*32	⚠	B61454M00AP	THERMAL CUTOUT (MAGNETRON)	1	
*33	⚠	B61524740AQ	SOCKET	1	
*34		B60304080BP	INCANDESCENT LAMP	1	
*35	⚠	A692Y4M00QP	NOISE FILTER (U)	1	
*36	⚠	B63317550GP	FUSE	1	(10A)
*37	⚠	B910C4760QP	AC CORD W/ PLUG	1	ALL QPQ/JPG MODELS
*37	⚠	B910C5500VN	AC CORD W/ PLUG	1	ALL VPE MODELS
*38	⚠	A606Y4J21QP	H. V. INVERTER(U)	1	ALL QPQ/JPG MODELS
*38	⚠	A606Y4J00XN	H. V. INVERTER(U)	1	ALL VPE MODELS
*39		B65854M00AP	INVERTER BRACKET A	1	
*40		B66624M00AP	GROUNDING PLATE	1	
*41		XTF5+AF10	SCREW	4	(4X8) FOR MAGNETRON
*42	⚠	2M236-M42E2	MAGNETRON	1	
*43		B3136-1480	HOOK SPACER A	1	
*44		J3097-1480	LATCH SPRING	1	
*45		XTW4+12T	SCREW	4	
*46		B0922000CH	CUSHION	1	
*47		XTT4+12BFZ	SCREW	2	MODELS WITH BLACK OUTER PANEL

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*47		XTT4+12BC	SCREW	2	MODELS WITH WHITE OR ALMOND OUTER PANEL
*48		B64498660AP	SENSOR COVER A	1	ALL NN-S769/S789/S989 MODELS
*49		B64508660AP	SENSOR COVER B	1	ALL NN-S769/S789/S989 MODELS
*50		B65438660AP	SENSOR COVER C	1	ALL NN-S769/S789/S989 MODELS
*51		A607S4M00AP	STEAM SENSOR	1	ALL NN-S769/S789/S989 MODELS
*52		AMQ0908000AE	CUSHION RUBBER A	1	ALL NN-S769/S789/S989 MODELS
*53		AMQ0922000AD	CUSHION	1	ALL NN-S769/S789/S989 MODELS
54		A6901-1170	FERRITE CORE	1	
*55		B40964M00CP	FARADAY CAGE		ALL NN-S989 MODELS
*55		B40964P00QP	FARADAY CAGE	1	ALL NN-S759/S769/S789 MODELS
*		B08878640AP	TOUCH-UP PAINT (BLACK)	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B08878640HAP	TOUCH-UP PAINT (WHITE)	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B0887705AAP	CAVITY SPRAY PAINT	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
*		B0887700AAP	TOUCH-UP PAINT	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY

DOOR ASSEMBLY

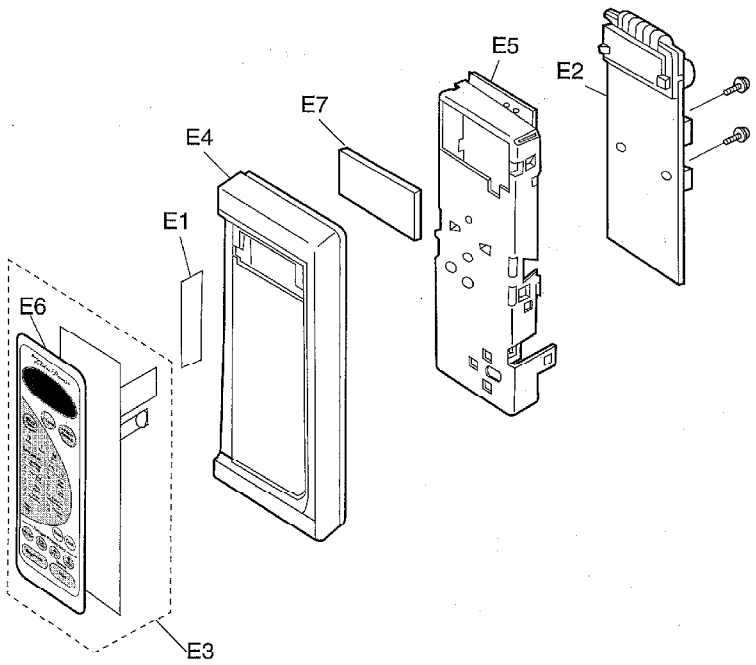


(S-4P0H QPQ)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*D1		B32224P00AP	NEOPRENE 2 SIDED TAPE	1	LOCATED INSIDE TOP CORNER (HINGE SIDE) OF DOOR A
*D2		B30124P00AP	DOOR HANDLE / BLACK / 1.6	1	NN-S759BAQPQ, NN-S769BAQPQ/JPG
*D2		B30124P00HAP	DOOR HANDLE / WHITE / 1.6	1	ALL NN-S759WA/S769WA/S789WA MODELS
*D2		B30124M00HAP	DOOR HANDLE / WHITE / 2.1	1	NN-S989WAQPQ/JPG
*D3		B30188350AP	DOOR KEY A	1	
*D4		B30214000AP	DOOR KEY SPRING	1	
*D5		XTNANE3+14G	SCREW	1	
*D6	⚠	B30854P00AP	DOOR C / BLACK / 1.6	1	ALL NN-S759/S769/S789 MODELS
*D6	⚠	B30854M00AP	DOOR C / BLACK / 2.1	1	NN-S989WAQPQ/JPG
*D7	⚠	B302K4P00QP	DOOR E (U) / BLACK / 1.6	1	ALL NN-S759/S769/S789 MODELS
*D7	⚠	B302K4M00QP	DOOR E (U) / BLACK / 2.1	1	NN-S989WAQPQ/JPG
*D8	⚠	B31454P00AP	DOOR SCREEN A / 1.6	1	ALL NN-S759/S769/S789 MODELS
*D8	⚠	B31454M00AP	DOOR SCREEN A / 2.1	1	NN-S989WAQPQ/JPG
*D9	⚠	B301A4P00AP	DOOR A (U) / BLACK / 1.6	1	NN-S759BAQPQ, NN-S769BAQPQ/JPG (NOTE 1)
*D9	⚠	B301A4P00HAP	DOOR A (U) / WHITE / 1.6	1	ALL NN-S759WA/S769WA/S789WA MODELS (NOTE 1)
*D9	⚠	B301A4M00HAP	DOOR A (U) / WHITE / 2.1	1	NN-S989WAQPQ/JPG (NOTE 1)
*D10	⚠	B31464P00AP	DOOR SCREEN B / 1.6	1	ALL NN-S759/S769/S789
*D10	⚠	B31464M00AP	DOOR SCREEN B / 2.1	1	NN-S989WAQPQ/JPG
*D11		XTW3+6Q	SCREW	4	
*D12	⚠	B01726210JP	CAUTION LABEL	1	ALL JPG MODELS

NOTE 1: Please order Door A and Caution Label together.

ESCUTCHEON BASE ASSEMBLY

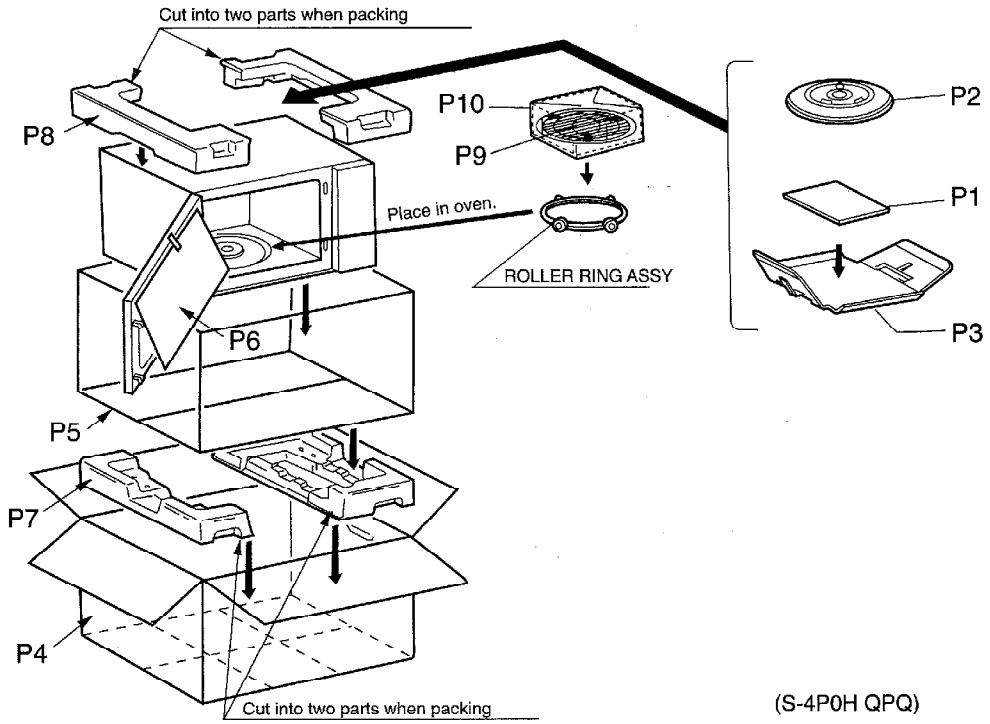


(S-4P0H QPQ)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*E1		B00079330QP	NAME PLATE	1	ALL QPQ MODELS
*E1		B00078940HQP	NAME PLATE	1	ALL JPG/VPE MODELS
*E2#		B603L4P20QP	D. P. CIRCUIT (U)	1	NN-S759BAQPQ, NN-S759WAQPQ RTL (W/COMPONENTS)
*E2#		B603L4P20JP	D. P. CIRCUIT (U)	1	NN-S759WAJPG RTL (W/COMPONENTS)
*E2#		B603L4P20VP	D. P. CIRCUIT (U)	1	NN-S759WAVPE RTL (W/COMPONENTS)
*E2#		B603L4P10QP	D. P. CIRCUIT (U)	1	NN-S769BAQPQ, NN-S769WAQPQ RTL (W/COMPONENTS)
*E2#		B603L4P10JP	D. P. CIRCUIT (U)	1	NN-S769BAJPG RTL (W/COMPONENTS)
*E2#		B603L4P10VP	D. P. CIRCUIT (U)	1	NN-S769WAVPE RTL (W/COMPONENTS)
*E2#		B603L4P00QP	D. P. CIRCUIT (U)	1	NN-S789WAQPQ RTL (W/COMPONENTS)
*E2#		B603L4P00JP	D. P. CIRCUIT (U)	1	NN-S789WAJPG RTL (W/COMPONENTS)
*E2#		B603L4M00QP	D. P. CIRCUIT (U)	1	NN-S989WAQPQ RTL (W/COMPONENTS)
*E2#		B603L4M00JP	D. P. CIRCUIT (U)	1	NN-S989WAJPG RTL (W/COMPONENTS)
*E3#		B630Y4P20QP	MEMBRANE SWITCH (U)	1	NN-S759BAQPQ (W/ESCUTCHEON SHEET)
*E3#		B630Y4P20HQP	MEMBRANE SWITCH (U)	1	NN-S759WAQPQ/JPG/VPE (W/ESCUTCHEON SHEET)
*E3#		B630Y4P10QP	MEMBRANE SWITCH (U)	1	NN-S769BAQPQ/JPG (W/ESCUTCHEON SHEET)
*E3#		B630Y4P10HQP	MEMBRANE SWITCH (U)	1	NN-S769WAQPQ/VPE (W/ESCUTCHEON SHEET)
*E3#		B630Y4P00HQP	MEMBRANE SWITCH (U)	1	NN-S789WAQPQ/JPG (W/ESCUTCHEON SHEET)
*E3#		B630Y4M00HQP	MEMBRANE SWITCH (U)	1	NN-S989WAQPQ/JPG (W/ESCUTCHEON SHEET)
*E4		B80344P00AP	ESCUTCHEON BASE / 1.6	1	NN-S759BAQPQ, NN-S769BAQPQ/JPG (NOTE 2)
*E4		B80344P00HAP	ESCUTCHEON BASE / 1.6	1	ALL NN-S759WA/S769WA/S789WA MODELS (NOTE2)
*E4		B80344M00HAP	ESCUTCHEON BASE / 2.1	1	NN-S989WAQPQ/JPG (NOTE 2)
*E5		B81274M00AP	BACK PLATE	1	
*E6#		B83374P20QP	ESCUTCHEON SHEET / 1.6	1	NN-S759BAQPQ
*E6#		B83374P20HQP	ESCUTCHEON SHEET / 1.6	1	NN-S759WAQPQ/JPG/VPE
*E6#		B83374P10QP	ESCUTCHEON SHEET / 1.6	1	NN-S769BAQPQ/JPG
*E6#		B83374P10HQP	ESCUTCHEON SHEET / 1.6	1	NN-S769WAQPQ/VPE
*E6#		B83374P00HQP	ESCUTCHEON SHEET / 1.6	1	NN-S789WAQPQ/JPG
*E6#		B83374M00HQP	ESCUTCHEON SHEET / 2.1	1	NN-S989WAQPQ/JPG
*E7		B80024M00AP	DISPLAY LENS	1	

NOTE 2: Please order Escutcheon Base and Name Plate together.

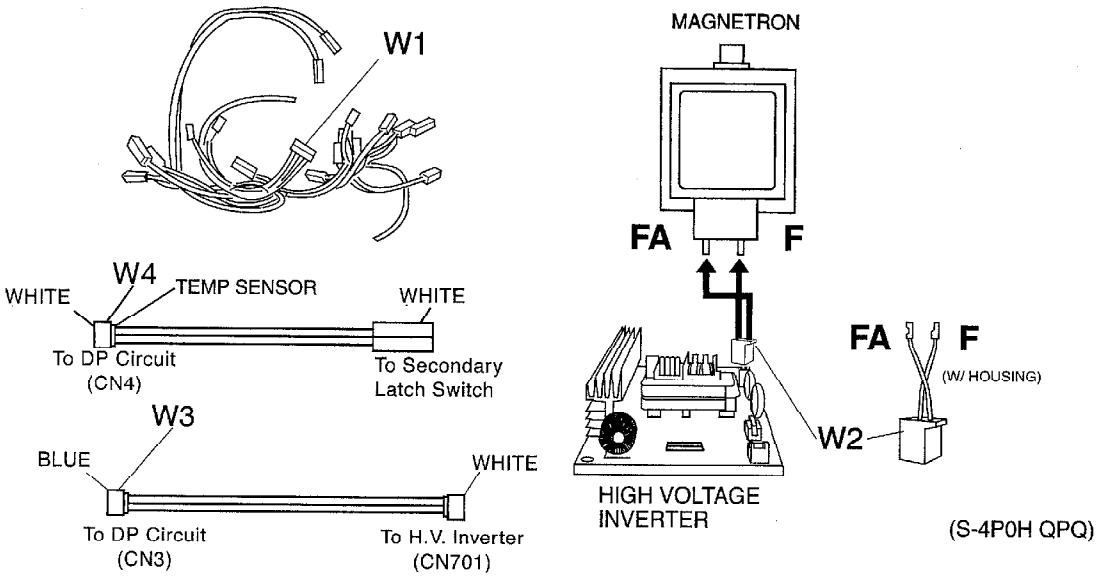
PACKING AND ACCESSORIES



(S-4P0H QPQ)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*P1#		B00034M00QP	INSTRUCTION MANUAL	1	
*P2		A06014A00AP	COOKING TRAY / 1.6	1	ALL 1.6 MODELS
*P2		A06014M00AP	COOKING TRAY / 2.1	1	NN-S989WAQPQ/JPG
*P3		B02214P00AP	UPPER SUPPORT PACKING / 1.6	1	ALL 1.6 MODELS
*P3		B02214M00AP	UPPER SUPPORT PACKING / 2.1	1	NN-S989WAQPQ/JPG
*P4#		B010A4P30AP	CARTON ASSY / 1.6	1	ALL 1.6 MODELS
*P4#		B010A4M30AP	CARTON ASSY / 2.1	1	NN-S989WAQPQ/JPG
*P5		B01064M00AP	P. E. BAG	1	
*P6		B01074M00AP	DOOR SHEET	1	
*P7		B01054M00AP	LOWER FOAM FILLER	1	
*P8		B01044M00AP	UPPER FOAM FILLER	1	
*P9		B060X4P00AP	2 LEVEL RACK ASSY / 1.6	1	ALL 1.6 MODELS
*P9		B060X4M00AP	2 LEVEL RACK ASSY / 2.1	1	NN-S989WAQPQ/JPG
		B07064P00AP	2ND LEVEL RACK ONLY / 1.6	1	ALL 1.6 MODELS
		B07064M00AP	2ND LEVEL RACK ONLY / 2.1	1	NN-S989WAQPQ/JPG
		B06434P00AP	RACK SUPPORT ONLY / 1.6	3	ALL 1.6 MODELS
		B06434M00AP	RACK SUPPORT ONLY / 2.1		NN-S989WAQPQ/JPG
*P10#		B01084P00AP	2ND LEVEL RACK DIE CUT / 1.6	1	ALL 1.6 MODELS
*P10#		B01084M00AP	2ND LEVEL RACK DIE CUT / 2.1	1	NN-S989WAQPQ/JPG

WIRING MATERIALS



Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*W1		B030A4P00QP	LEAD WIRE HARNESS	1	ALL 1.6 MODELS
*W1#		B030A4M00QP	LEAD WIRE HARNESS	1	ALL 2.1 MODELS
*W2		B03504M00AP	H.V. LEAD WIRE (INVERTER)	1	ALL 1.6 MODELS
*W2		B03504M00QP	H.V. LEAD WIRE (INVERTER)	1	ALL 2.1 MODELS
*W3		B03524M00AP	L.V. LEAD WIRE (INVERTER)	1	
*W4		B03534M00AP	LEAD WIRE	1	

DIGITAL PROGRAMMER CIRCUIT (ALL NN-S759, NN-S769, NN-S789, NN-S989 MODELS)

PARTS LIST

Note: Items marked * are supplied by MMOC (MAC) (U.S.A.)
Note: Items marked # are new Part No's. for Pre I.G. (Initial Guidance) list.

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
BZ310	AEFB22EP20TL	BUZZER	1	2.0KHZ
C10	ECA1VM471E	ELECTROLYTIC CAPACITOR, AL.	1	470μF/35V/±20%
C30-38	AECU1F101J50	ELECTROLYTIC CAPACITOR, AL.	9	100μF/50V/±20%
C301	ECEA1HKAR47B	ELECTROLYTIC CAPACITOR	1	
C11	ECEA1CKA220B	ELECTROLYTIC CAPACITOR, AL.	1	22μF/16V/±20%
C100, 330, 340	AECU1F103Z50	CERAMIC CAPACITOR	3	0.01μF/25V/ -20%+80%
C12, 221, 290, 291, 300	AECU1F104Z25	CERAMIC CAPACITOR	5	0.01μF/50V/ -20%+80%
CN1	AEEMMF01505W	CONNECTOR	1	5PIN
CN2	AEEMMF00703W	CONNECTOR	1	3PIN, ALL NN-S769/789/989 MODELS
CN6	AEEM09FDZBTM	CONNECTOR	1	9PIN
CN4	AEEMXF00D04W	CONNECTOR	1	4PIN
CN3	AEEMMF00703B	CONNECTOR	1	3PIN
CX320	EF0MC8004T4	CERAMIC RESONATOR	1	8.00MHz
D10	1N4Q03EG3	DIODE, SI	1	
D30, 31 220, 221, 222,340	1N4148M-TA	DIODE, SI	6	
D190, 191, 192	AESQTLGE260T	LED(G)	3	
DISP1*	AFDDHLC4M0AP	LCD	1	
IC1*#	AEIC8C34A118	L.S.I.	1	
IC220	AN6747B	IC	1	
IC480	AEHMH705S	IC	1	
Q10	2SD2006QRTA	TRANSISTOR, SI, 1.2W	1	(120MHZ)
Q190	2SD1859TV2	TRANSISTOR	1	
Q191, 220	2SC2412KT146	TRANSISTOR	2	
Q192	DTC123JKA	TRANSISTOR	1	
Q340	DTC114EKA	TRANSISTOR	1	

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
R223, 325-328	ERJ3GSYJ103V	CARBON FILM RESISTOR	5	10KΩ, 1/4W, ±5%
R341, 480, 481	ERJ3GSYJ472V	CARBON FILM RESISTOR	3	4.7KΩ, 1/4W, ±5%
R10,11	ERDS2TJ102T	CARBON FILM RESISTOR	2	1.0KΩ, 1/4W, ±5%
R330	ERJ3GSYJ471V	CARBON FILM RESISTOR	1	470Ω, 1/4W, ±5%
R39-47, 101-103, 222,311, 461	ERJ3GSYJ102V	CARBON FILM RESISTOR	15	1KΩ, 1/4W, ±5%
R310	ERJ3GSYJ332V	CARBON FILM RESISTOR	1	3.3KΩ, 1/4W, ±5%
R460, C460	ERJ3GSYJ333V	CARBON FILM RESISTOR	2	33KΩ, 1/4W, ±5%
R100	ERJ3GSYJ220V	CARBON FILM RESISTOR	1	22Ω,1/4W, ±5%
R191	ERJ3GSYJ390V	CARBON FILM RESISTOR	1	39Ω,1/4W, ±5%
R30-38, 350	ERJ3GSYJ104V	CARBON FILM RESISTOR	10	100KΩ, 1/4W, ±5%
R190, 290	ERDS2TJ103T	CARBON FILM RESISTOR	2	10KΩ, 1/4W, ±5%
R300	ERJ3GSYJ682V	CARBON FILM RESISTOR	1	6.8KΩ, 1/4W, ±5%
RY1 ⚠	AEGG5G1A12	POWER RELAY	1	(12V)
RY2 ⚠	AEBGG5N1A18	POWER RELAY	1	(18V)
SP1*	A611A4J00XN	LCD HOLDER (U)	1	
T10 ⚠	ETP35KAN42BU	TRANSFORMER	1	
ZD10	MTZJ5.6B	ZENER DIODE,SI	1	
D25	ERZV10D271E3	VARISTOR	1	270V
D26, 27	ERZV10D112C1	VARISTOR	2	

SERVICE FIXTURES AND TOOLS

EXTENSION CABLES

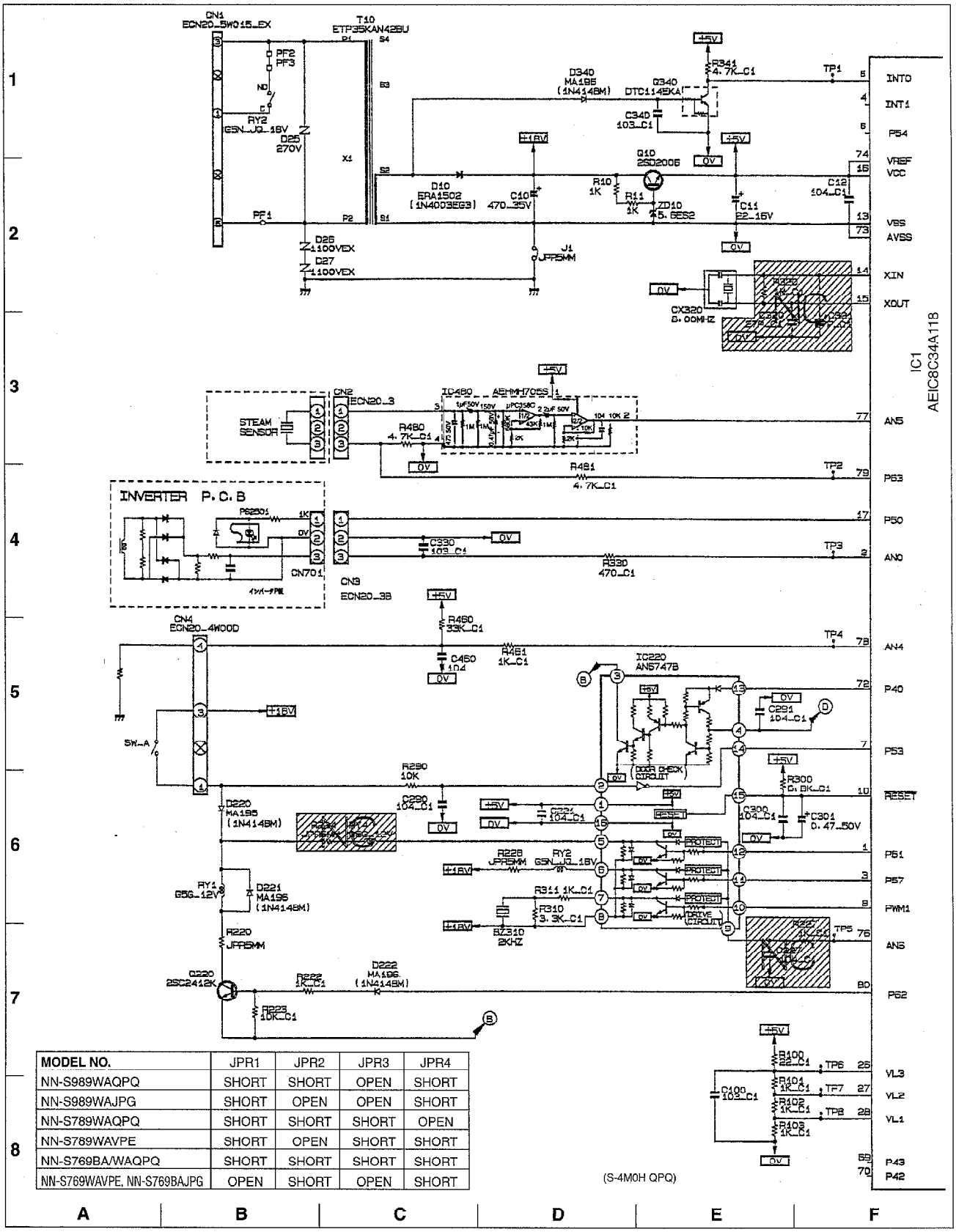
NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
	AT40P003	3 pin Extension Cable	1	Cable No. 48
	AT40P004	4 pin Extension Cable	1	Cable No. 47
	AT40P005	5 pin Extension Cable	1	Cable No. 46
	AT40E006	1 pinX6 Extension Cable	1	Cable No. 9

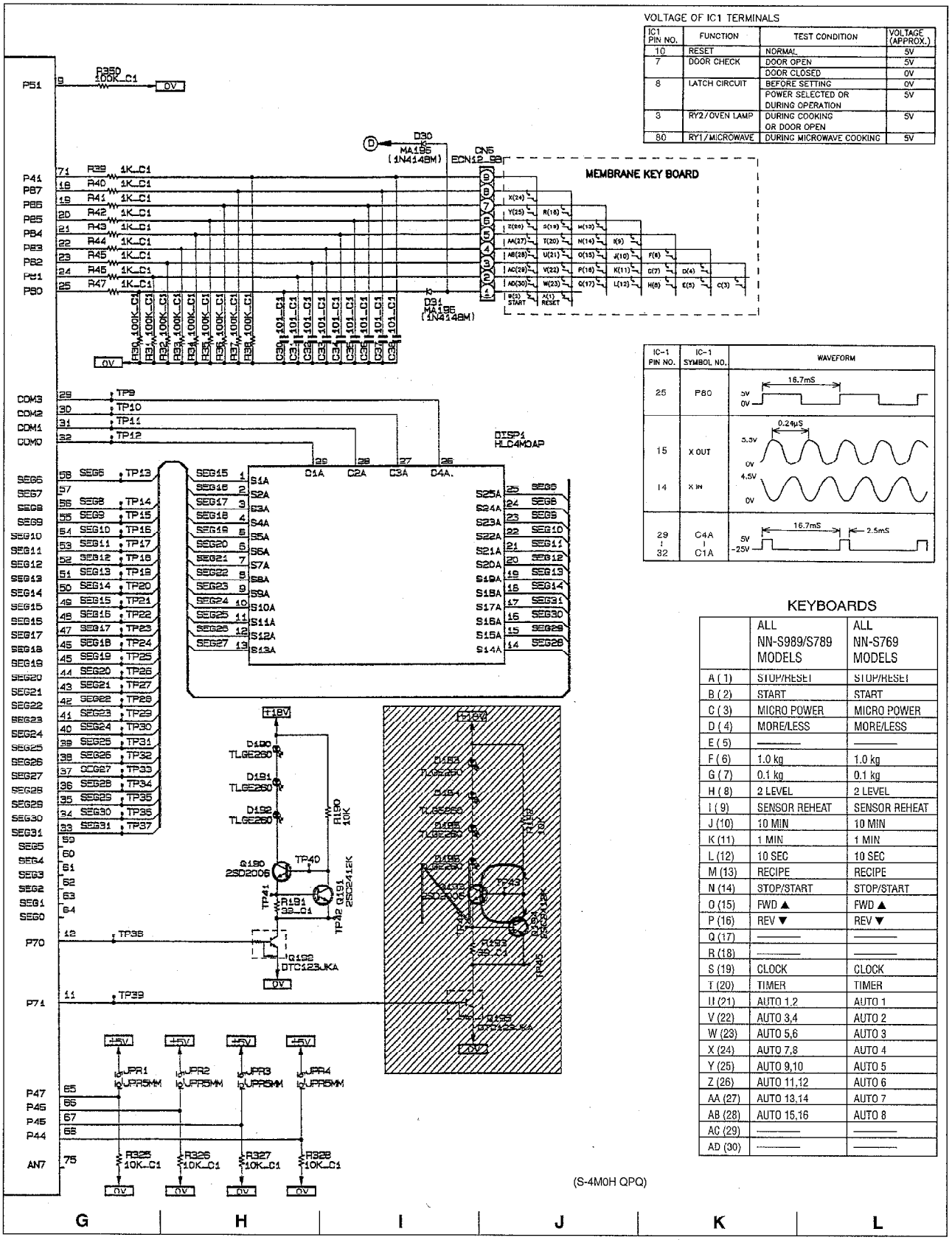
MEMO

DIGITAL PROGRAMMER CIRCUIT (ALL NN-S989, NN-S789 & NN-S769 MODELS)

SCHEMATIC DIAGRAM



MODEL NO.	JPR1	JPR2	JPR3	JPR4
NN-S989WAQPQ	SHORT	SHORT	OPEN	SHORT
NN-S989WAJPG	SHORT	OPEN	OPEN	SHORT
NN-S789WAQPQ	SHORT	SHORT	SHORT	OPEN
NN-S789WAVPE	SHORT	OPEN	SHORT	SHORT
NN-S769BA/WAQPQ	SHORT	SHORT	SHORT	SHORT
NN-S769WAVPE, NN-S769BAJPG	OPEN	SHORT	OPEN	SHORT



VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
10	RESET	NORMAL	5V
7	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSED	0V
8	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
3	RY2/OVEN LAMP	DURING COOKING OR DOOR OPEN	5V
80	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V

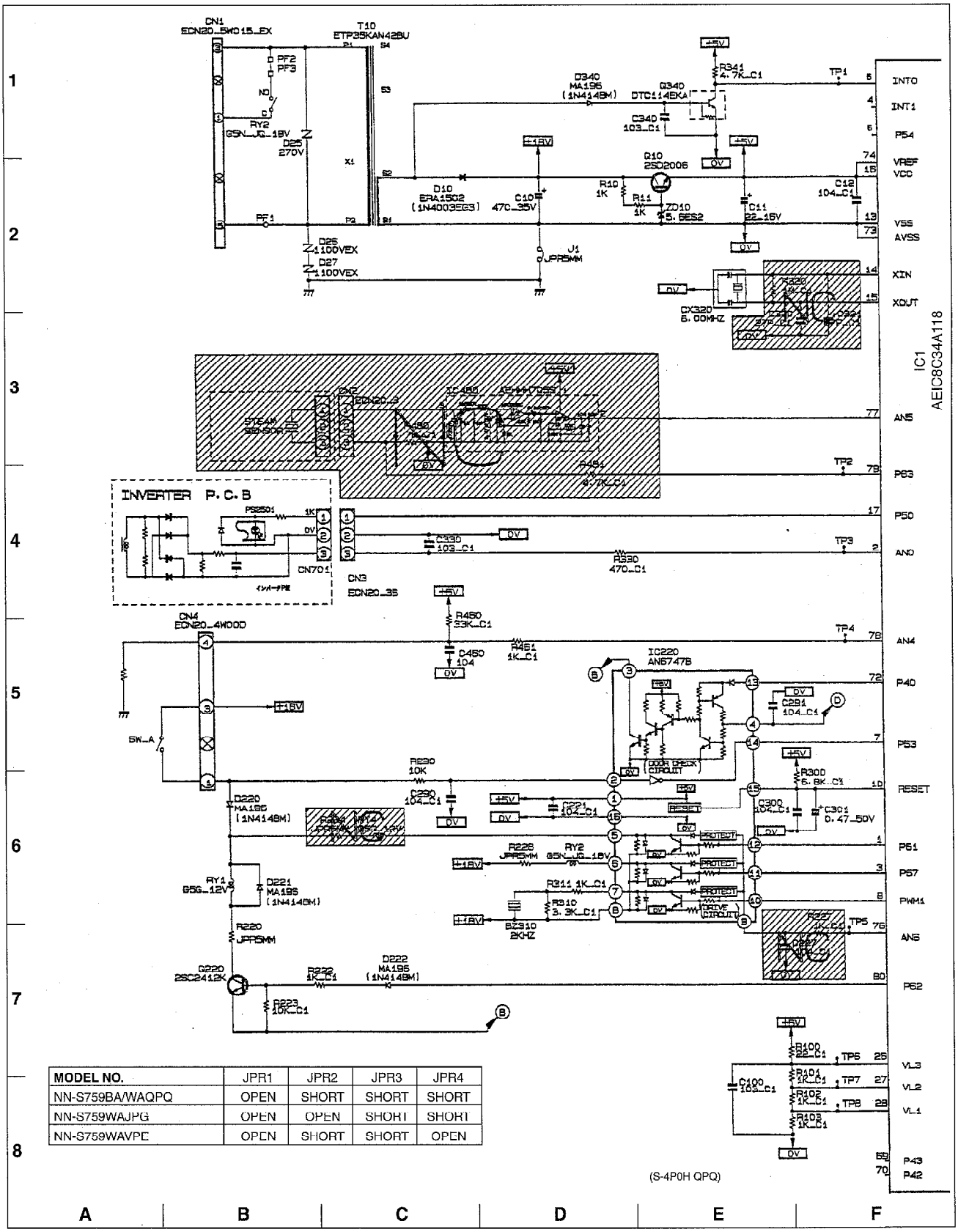
IC-1 PIN NO.	IC-1 SYMBOL NO.	WAVEFORM
25	P80	16.7mS, 5V, 0V
15	X OUT	0.24μS, 5.3V, 0V
14	X IN	4.5V, 0V
29 ↓ 32	C4A ↓ C1A	16.7mS, 2.5mS, 5V, -25V

KEYBOARDS

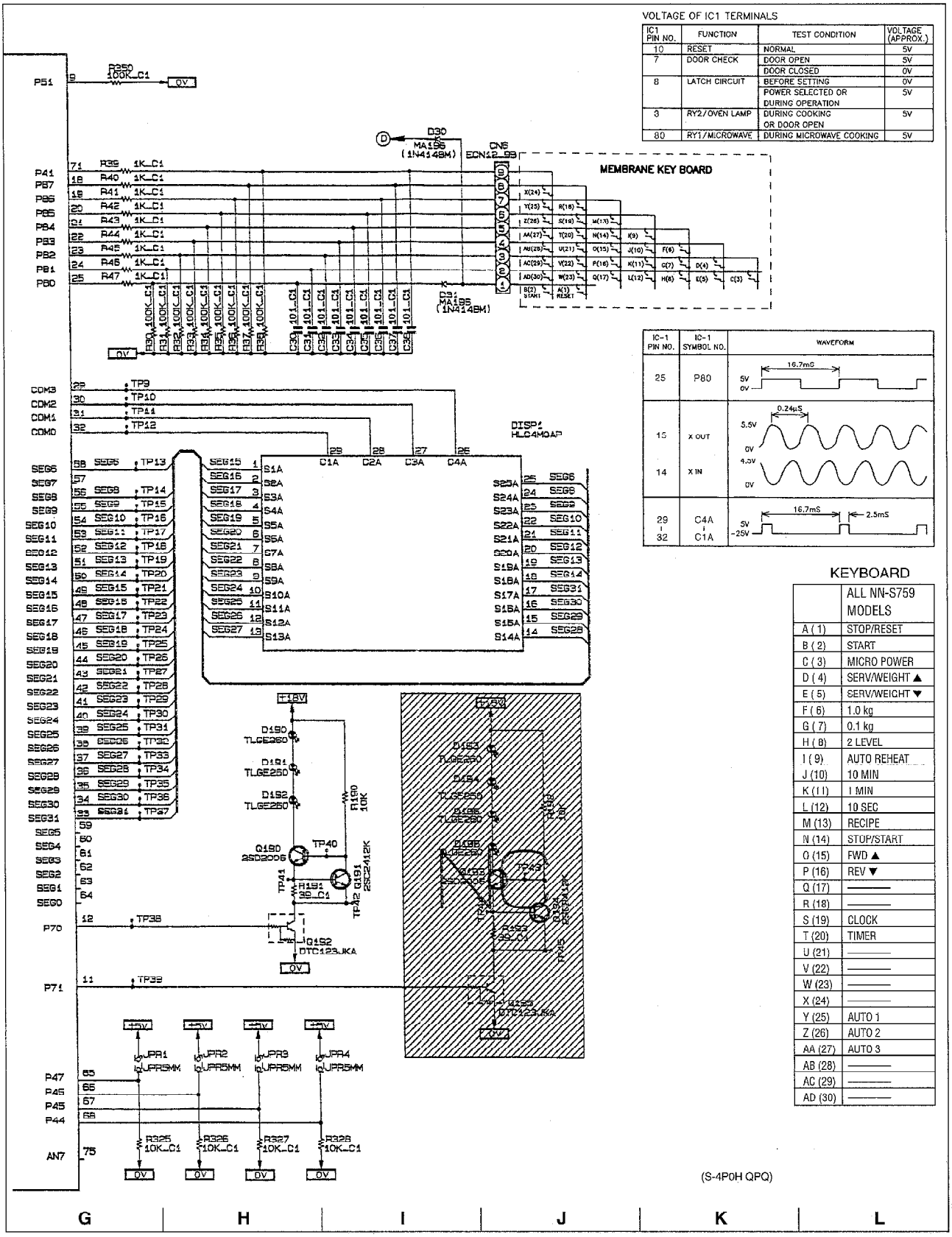
	ALL NN-S989/S789 MODELS	ALL NN-S769 MODELS
A (1)	STOP/RESET	STOP/RESET
B (2)	START	START
C (3)	MICRO POWER	MICRO POWER
D (4)	MORE/LESS	MORE/LESS
E (5)	———	———
F (6)	1.0 kg	1.0 kg
G (7)	0.1 kg	0.1 kg
H (8)	2 LEVEL	2 LEVEL
I (9)	SENSOR REHEAT	SENSOR REHEAT
J (10)	10 MIN	10 MIN
K (11)	1 MIN	1 MIN
L (12)	10 SEC	10 SEC
M (13)	RECIPE	RECIPE
N (14)	STOP/START	STOP/START
O (15)	FWD ▲	FWD ▲
P (16)	REV ▼	REV ▼
Q (17)	———	———
R (18)	———	———
S (19)	CLOCK	CLOCK
T (20)	TIMER	TIMER
U (21)	AUTO 1,2	AUTO 1
V (22)	AUTO 3,4	AUTO 2
W (23)	AUTO 5,6	AUTO 3
X (24)	AUTO 7,8	AUTO 4
Y (25)	AUTO 9,10	AUTO 5
Z (26)	AUTO 11,12	AUTO 6
AA (27)	AUTO 13,14	AUTO 7
AB (28)	AUTO 15,16	AUTO 8
AC (29)	———	———
AD (30)	———	———

DIGITAL PROGRAMMER CIRCUIT (ALL NN-S759 MODELS)

SCHEMATIC DIAGRAM



MODEL NO.	JPR1	JPR2	JPR3	JPR4
NN-S759BA/WAQPQ	OPEN	SHORT	SHORT	SHORT
NN-S759WAJPG	OPEN	OPEN	SHORT	SHORT
NN-S759WAVPE	OPEN	SHORT	SHORT	OPEN



VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
10	RESET	NORMAL	5V
7	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSED	0V
8	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
3	RY2/OVEN LAMP	DURING COOKING OR DOOR OPEN	5V
80	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V

IC-1 PIN NO.	IC-1 SYMBOL NO.	WAVEFORM
25	P80	16.7mS, 5V, 0V
15	X OUT	0.24μS, 5.5V, 0V
14	X IN	4.5V, 0V
29 ↓ 32	C4A ↓ C1A	16.7mS, 2.5mS, 5V, -25V

KEYBOARD

	ALL NN-S759 MODELS
A (1)	STOP/RESET
B (2)	START
C (3)	MICRO POWER
D (4)	SERV/WEIGHT ▲
E (5)	SERV/WEIGHT ▼
F (6)	1.0 kg
G (7)	0.1 kg
H (8)	2 LEVEL
I (9)	AUTO REHEAT
J (10)	10 MIN
K (11)	1 MIN
L (12)	10 SEC
M (13)	RECIPE
N (14)	STOP/START
O (15)	FWD ▲
P (16)	REV ▼
Q (17)	———
R (18)	———
S (19)	CLOCK
T (20)	TIMER
U (21)	———
V (22)	———
W (23)	———
X (24)	———
Y (25)	AUTO 1
Z (26)	AUTO 2
AA (27)	AUTO 3
AB (28)	———
AC (29)	———
AD (30)	———